PRODUCT CARE PROJECT

Fix to Keep !

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MOSES KANG

**DEGREE PROJECT
FOR MASTER OF FINE ARTS IN DESIGN**

LUND UNIVERSITY

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SCHOOL OF INDUSTRIAL DESIGN**   **2012**

PRODUCT CARE PROJECT

Fix to Keep !

Degree Project for Master of Fine Arts in Design, Main Field of Study Industrial Design, from Lund University, School of Industrial Design.

Project author: Master student Moses Kang , moses4eco@gmail.com
Project supervisor: Professor Per Liljeqvist , per@liljeqvistdesign.se
Project examiner: Professor, Director Claus-Christian Eckhardt, claus.eckhardt@design.lth.se
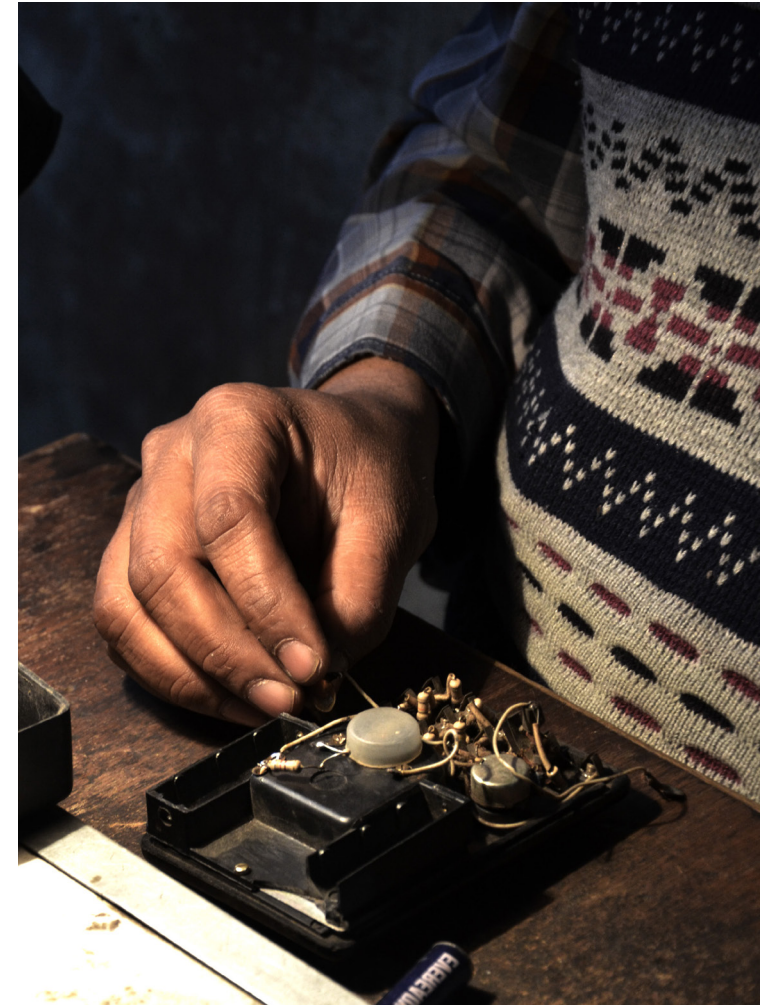Lund University School of Industrial Design LTH, Lund Sweden, 2012.

Project code: IDEM 05.

LUND UNIVERSITY

School of Industrial Design

ACKNOWLEDGMENT

ABSTRACT

A project is about trying to create a concepts which represents responsible consumption and responsible production. Since my title of thesis is named " Product Care Project" I have tried to think how products designed with care would look like.

PROBLEM

Through this project I am responding to intentionally produced goods for shorter life cycle and a strict control to prevent users to repair or maintain their belongings. This achieved by producing products repair unfriendly and also by controlling whole product development infrastructure to make an access of maintenance complicated for users. A user has no choice, but to buy a new product instead even trying to fix it. This manner of production should be a breach of consumer rights, but since buy, use shortly and discard culture is so embodied in our daily lives that majority of people do not care or does not dare to change it because of the pressure from the society. As a result, now we face an environmental and moral catastrophe which has to be changed.

TRY TO GET A HOLISTIC VIEW OF PRODUCT DEVELOPMENT AND TRY TO ESTABLISH A ROLE AS A DESIGNER.

Why and how we ended up that we to have change objects more and more often? Do people realized that they victims of industries planned obsolescence? Is that the only way of mass producing products to profit? Can repair friendly products exist in the market?

In this project I have gained a holistic view of a product development. I have tried to get in touch with current system and try to imagine possible changes towards more responsible production and consumption.

RESULTS

As a result I have realized that repair friendly products can exist not only for DIY, Makers subculture society, but also for modern day businesses. The only step industry has to establish is to provide an equal connection between the user, the creator, and the product. Users also have to take actions by having a mind set not to overconsume and demand for better products.
To express my thoughts I have designed headphones.

HEADPHONES DESIGNED WITH CARE

Headphones are modular. Modular means that it is also customizable based on customers needs. Modular means that product can last longer since parts are replaceable. The benefits of a modular product is that every part is valuable. Even a product stops functioning parts are reusable.

Taking care of your object is also fun. I want to express that a moderate time investment in to an object can make it more valuable. So instead of offering an object with a very obvious solution to build or repair in few minutes, I would like to give a moderate amount of challenge as in principles of puzzle toys.

" CARE?

CONTENT

1. BACKGROUND

1.1 PROBLEM

In todays society our economy is based on consumption of middle class people. Consumers have ability to dictate an economic structure of our society than ever before. The Industry is focused on consumer demands. To give an instant access to large quantity of cheap goods is the first priority for industries. That is how Wester world has been shaped since the beginning of nineteenth century after the industrial revolution which resulted with number of issues which we face now.

Since industry is focused on providing cheap goods to consumers, the quality of products has become very low which results producing more and more products for consumers in order to keep production in a desirable stage. The industry has succeeded to establish "Planned Obsolescent" a policy of planning or designing a product with a limited useful life or "Perceived Obsolescent" when a products become undesirable anymore even it still functions.

There are numbers of issues in a global scale influencing both our physical and ethical world. What I would like to focus in my thesis is about irresponsible production and irresponsible consumption people make. Products are not only cheaply produced to last shorter, but also the access for repair or maintenance is blocked from a user. A user has no choice, but to buy a new product instead even trying to fix it. This manner of production should be a breach of consumer rights, but since buy,

use shortly and discard culture is so embodied in our daily lives that majority of people do not care or does not dare to change it because of the pressure from the society. As a result, now we face an environmental and moral catastrophe which has to be changed.

Now we clearly know that the system we have created a hundred years ago has it own limits. However a solution what people implement to change a system is by adding more to compensate the gaps within a system which leads to addiction of resources needed to support a system. For instanced, lets say our oil reserves goes down, then what people tent to do is to get some more oil from somewhere else, instead of reducing oil consumption. Or if we face health problems, people tent to take drugs or surgery instead of changing their everyday habits. The same counts to our consumer culture. Instead of fixing our goods we buy a new one to satisfy our needs. Maybe we do not even need those product to make us happy?

Is that a world which I want to see? Is that what I am going face after my graduation? Will I have to work as promoter of irresponsible consumption? Or is there any other options? If I had all the resources and influence, what ideals and strategy I would use to change the system?

I am tackling, a huge phenomena here. The professor Olof Kolte was right that the project is very challenging. It is a global problem. It relates not only to industrial infrastructure, resources, energy, network, but also to our morals behavior. However, I am sure that as a master student I can deliver an interesting concept to represent a responsible consumption and responsible production.

"
Buy, use shortly and discard culture is so embodied in our daily lives that majority of people do not even notice or dare to change it. As a result, now we face an environmental and moral catastrophe.

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1.2 PROJECT BACKGROUND

A project is about trying to create a concepts which represents responsible consuming and responsible production. How I am going to do that? Since, I named my project "PRODUCT CARE PROJECT" I am going to focus on word "CARE". Designing a product with care and what is care when it comes to a consumption?

RESEARCH PHASE 1

So what is care when it comes to product and it is usage? Taking care is something what you maintain and repair. Does any of products especially electronics allow us to be maintained or fixed? I really doubt about that. Everything nowadays are just bought and thrown away after the usage not only because they are not repairable anymore, but also because they are undesirable. A first thing I have done for my research was to try repair different kinds of products specifically related to electricity like a lamp, a hair dryer, coffee machine, a monitor etc. to get familiar with manufacturing methods and to see if they are repairable or not. By repairing stuff I also questioned my self why these product are designed in a certain manner. Why they are not designed to be easily maintained and recycled by consumer itself?

RESEARCH PHASE 2

Second stage, was about case studying people or organizations who are rebellious against our society related to

my topics. In this time of financial and ecological crisis I am pretty sure that I can find a lot of people who has implemented the same thinking as me.

A second stage also includes some literature readings to gain solid theoretical background and to add more holistic thinking to my project. A literature is mainly focused about product development. "Cradle to Cradle" is about sustainable development. "New Product Development For Dummies" is about traditional methods how to develop a new product. "Growing Modular" is about efficient development towards mass customized products for future users. A book "System Thinking" gave me insights how to tackle an existing system towards changes. These readings made me to think more holistically and apply more systematic thinking to my design process. Furthermore, readings also gave me a clear understanding about the role as an industrial designer in the ocean of product development.

RESEARCH PHASE 3

Inspiration

It was about understanding how and what people fix. Since reaching a target who fixes stuff is very complex process, a research stage was entirely based on internet. Luckily through internet I understood that fixing culture is not gone yet. Through different kinds of

forums and blogs I could not only gather some useful data, but also to get some inspirations for my concept.

An overview of my chosen object

I have chosen headphones to apply my concept. Therefore, a brief product analyses has been done. Functional and production methods analyzed together with a method how product is designed. An interview was made with a junior designer with an expertise related to headphones.

SUPERVISION

A discussions with my supervisor Per and examiner Claus have had contributed a lot to my project as well. Both are very different personas. Per was more ideal and theoretical, in a contrast Claus was more focused on a product it self. Although my project was not completely in favour on functional and practical aspects when it comes to product design. It was more about imagining how responsible design could look like in another words an ideal and romantic approach to design - what we call as a "Bulshit Project" here amongst my classmates.

Finally, all my research findings have been proceed and implemented to the concept using various kinds of creative techniques.

1.3 BRIEF

BRIEF

To introduce a concept that goes hand in hand with a notion that products can be assembled, maintained or reused by user itself. Also how responsible production could look like. Instead of assuming that all products are to be bought, owned, and thrown away by consumers.

The idea behind it is to give a notion to user how products are built so that they could gain a knowledge not only how to repair and maintain their belongings, but also think about the whole cycle of a product.
A project is about establishing an intimated relationship between producer and consumer for more long lasting and quality product in terms of responsible production and development.

The aim of the project is to gain insight towards systematic and sustainable thinking then it comes to a product development. A project also aimed to help me to establish a clear vision as a designer towards responsible design.

FORMING A RESEARCH QUESTION

Is it easy to repair and maintain products which are designed for short life cycle now?

Is it industries or users responsibility to take care of useless products?

How should designer promote responsible consuming and responsible consumption?

DEMARCATIONS

1. A context is focused on developed countries.

2. Research is focused on maintenance and repair issues concerning goods related to electricity.

3. Concept has to express responsible consuming and responsible production.

4. One consumers type of products will be chosen to demonstrate the concept. It is not necessary to provide technically functional objects, but prototypes should clearly state the idea. .

NOTES:

*A slight changes has been applied to the brief.
In the beginning, the project was mainly focused on product maintenance issue. Later on a repair topic directed me in to more systematic thinking which resulted in more holistic approach to my project.*

*Headphones are chosen for concept demonstration.
A picture of Plattan from Urban wear.*

1.4 METHODS

* Getting involved in a world of fixing by trying to repair anything on my way. Also try to understand the begging and end cycle of products.

* To observe the world of fixing. To observe repair and maintenance centers around my environment.

* To observe the world of fixing on line to get familiar with repair culture.

* Read literature relating to my thesis.

* Analyses of rising "DIY" and "MAKERS" culture.

* Case studying activist or organizations promoting responsible consumption and production.

* Basic analyses of a product which I am going to chose to express a concept.

* Interviewing a person with expertise of design of my chosen product.

* Implementing theory in to chosen object using various kinds of creative techniques:

Mind mapping, brainstorming, sketching, CAD modeling, CAD rendering, test model making, having discussions with classmates and professors etc.

A project starts with mind mapping. Start with a questions Why, What and How I going to proceed a project.

1.5 PROJECT PLAN

JAN.	FEB.	MAR.	APR.	MAJ.	JUN.

Brief

Forming aims

Meetings.

Research presentation

Research

Reading,
Product analyses,
Visit to institutions,
Meeting with experts,

Meetings.

Synthesis

Solution generation
using various kinds of
creative methods.

Meetings.

Final review
Meetings.

Realization

Getting ready to present.
Model, presentation, paper,

Public presentation.
exhibition

Exhibition

Project plan table.
Project duration Jan – Mid June 2012

Preparation for exhibition.

MID. JANUARY - END OF FEBRUARY (5 weeks)

After approval of project plan a research phase was proceed. 5 weeks were spend for research.

**END OF FEBRUARY - END OF MARCH
(5 weeks)**

Gathered information processed and brief will be updated. Various solution will be generated by using different creative techniques.

**REALIZATION (6 WEEKS)
END OF MARCH - MID. MAY 2012**

Refinement/ Visualization/ technical drawing/ cad simulation/ detailed mock up / presentation model/ Documentation / Written report.

PRESENTATION, BEGINNING OF JUNE 2012.

After the public presentation start preparing for the exhibition at A-house exhibition hall.
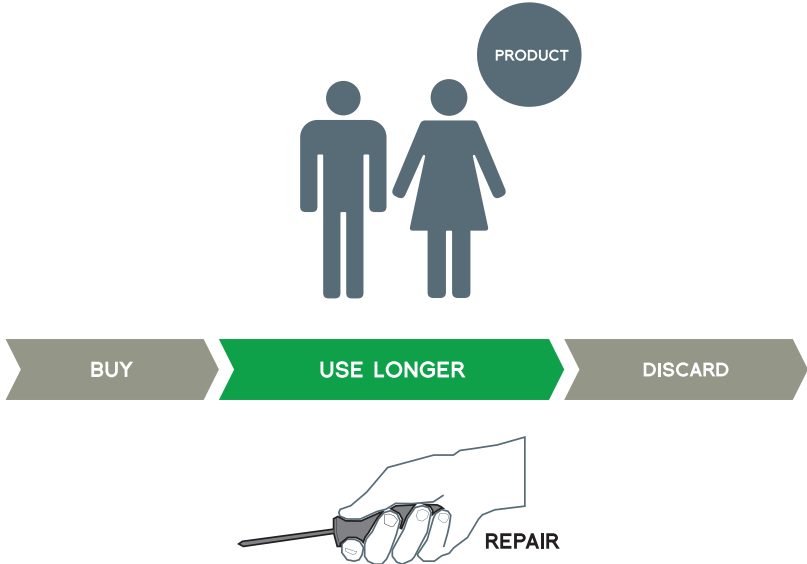
EXHIBITION, BEGINNING OF JUNE 2012.
Exhibition period.

The entire project was carried out at a division Lund University School of Industrial Design.

2. RESEARCH PHASE 1

" Fixing is fun !

Graph 1.0

2.1 GETTING INVOLVED IN A WORLD OF FIXING?

So What is care when it comes to a product and it is usage? Taking care is something what you maintain and repair. Does any of products especially electronics allow us to be maintained or fixed? I really doubt about that. Everything nowadays are just bought and thrown away after usage not only because they are not repairable anymore, but also because they are undesirable. My first research step was to try repair different kinds of products specifically related to electricity like a lamp, a hair dryer, coffee machine, a monitor etc. The aim is to get familiar with manufacturing methods and to see if they are repairable or not. By repairing stuff I also questioned my self why these product are designed in a certain manner. Why they are not designed to be easily maintained and recycled by consumer itself?

NOBODY KNOWS WHERE TO GET YOUR STUFF FIXED

It was very difficult to find a repair center. To get some help I asked people around me. Most of them were from Sweden because I assumed that locals should definitely know where to fix stuff. Unfortunately nobody knew, some of when suggested to go to the main big chains like "Media Mart" but the problem of these chains is that they overcharge products which are out of warranty or suggest to buy a new instead of keeping old. Mr. Sergey an engineer from our workshop told me that few years ago he knew a service center in Lund, but unfortunately company run out of business.

He thinks that center reoriented its business in to second handed product distribution to third world countries. Even the most experienced citizens of Sweden like my supervisor Per who is most likely more than 60 years old did not know where service centers could be.

ISN'T IT WEIRD?

Isn't it weird? Nobody knew where stuff could be fixed. In a way, why would you repair stuff which is worth less than 5 or 20 euros? Is it right? that products should last one or two years then just throw them away and go to shop another? I don't want to end up buying 3 toasters in my life. I want to buy it once because toaster is a toaster. It does one function well and that is enough. Buying another toaster wont make me smarter or more attractive. Having several watches that is something. A decent watch for work, a watch for exercise and a luxury fashion watch for clubbing. Moreover watches last long and you can inherit when to your grandchildren.

LETS FIX IT BY MY SELF !

Anyway forget about reasonable services - it is going to be time consuming and expensive. Lets just try to repair broken stuff by my self. I have decided to start with simplest object like LUXO table lamp which i found near e-waste collection container near our school.

? FIX
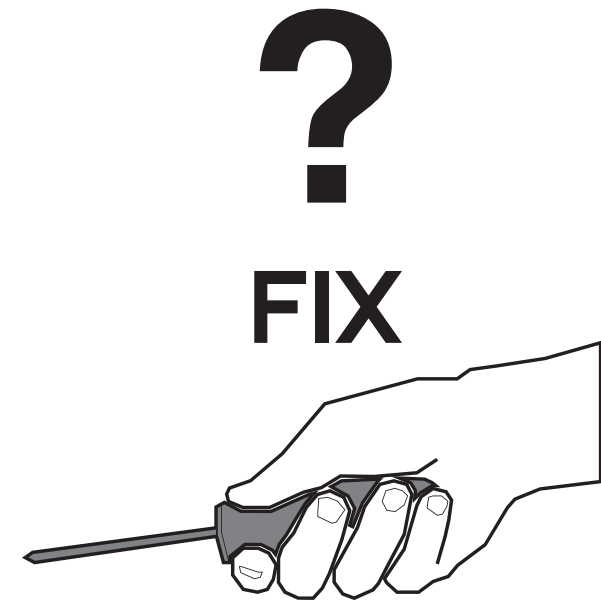
2.2 FIXING LUXO TABLE LAMP

A table lamp was founded in a container at back yard of school. It was very easy to identify a problem. The OF/ OFF switch button was stuck inside and did not come out. A tiny error made a user to throw away the entire object.

I started to disassemble the top part where switch was located. Since products has a simple structure it was not so difficult to reach a problem, but here it comes a problem. A switch part witch is a size of a block of sugar cube was sealed so that you had to use a hammer to completely open it. When I open it, I detected that inside of plastic switch part was broken and it just stuck in between the parts. I tried to separate parts and put it back but it did not work because simply it was broken.

I had to options . One way was to replace a switch with another switch from a different product, but that would result on changes in design of lamp and instead of having well fitted switch I would end up with an ugly switch which is aesthetically does not fit. There should be another option. Luxo lamps are known for its quality it is a Norwegian manufacturer they should have service centers

I e-mailed to customers service center, explained my problem and even sent pictures witch indicated a problem . I did not want any refund, what I only needed was a small switch. I asked them to sent it by post ,but have not got an answers so far.

Two days later I e-mailed again and still no answer. But few days latter I have reseved a post mail with part. Awesome, now I love Luxo company. It is truly a quality company and I am sincerely apologies about the complains I had before.

I just replaced a switch and a bulb support part. Switched some wires, fastened some screws and here we have one extra lamp for our studio.

LETS START WITH A LAMP

PROBLEM IS HERE

I GOT A PART
FROM LUXO !
THANK YOU
SO MUCH !

ITS WORKING !
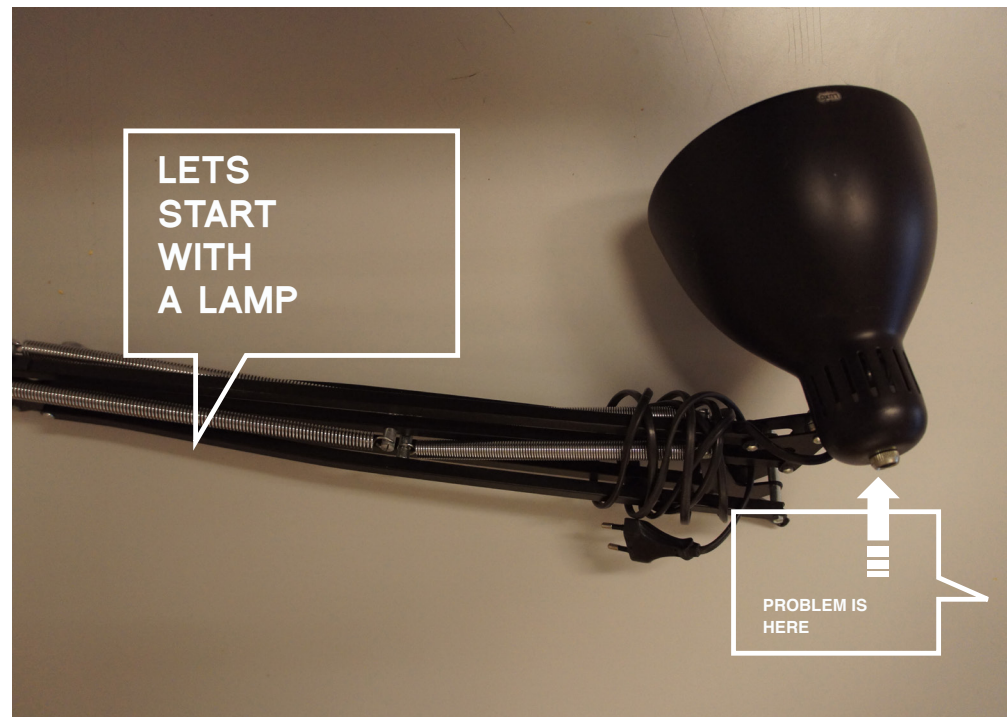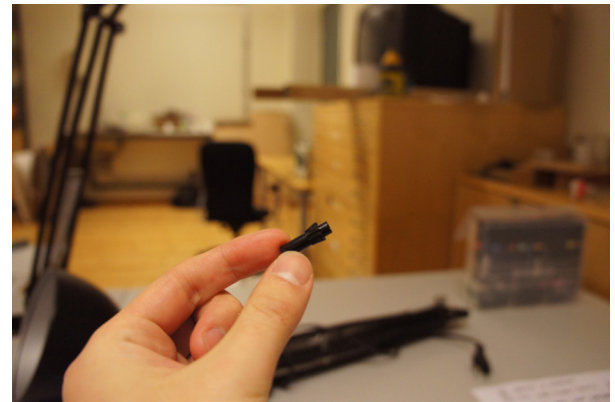
2.3 SAVING MELLISA HAIR DRYER

Mellissa hair dryer was found in my corridor. It was about to be thrown away, but I promised to bring it back to a life to its female user. Again the problem was a switch and that seems to be easy, however it did not turned as I expected. First of all, it was extremely difficult to take it apart. Obviously, an object is not made to be maintained. I had to unscrew screws which were not standart ones. A typical screwdrivers did not fit. What kind of screws are they? Screws were telling a clear message to the user "Don't even dare to open it". Moreover, the frame made out of ABS was painted with a weird red-violet color which absorbed all of dirt probably produced by it female user. A dirt absorbing material definitely makes a product undesirable after a while.

Mellisa, what kind of company is it? Wow, it is Scandinavian company and according to their website a company is occupying a solid position in Sweden and it offers high-quality products for daily tasks around the house. For me a design and quality does not really match to its products. Well, if it is Scandinavian it does not mean that everything here is well designed and in high quality. Scandinavians are also good at producing extremely cheap products. A perfect sample is companies such as H&M, IKEA, TIGER. What I would like to tell to Scandinavian people is to think twice before blaming China for its low quality products. Since Western Worl is behind of all these cheap products causing a global melt down.

So the problem was identified, but fixing it is a different topic. I could not unscrew it. I just could smash it with a hammer or throwing it on the ground, but that is not going to work. Then, I went to one of the workshop guys of our school to get some advice how to unscrew this. An engineer Sergey told me that we do not have such screws in our workshop. Mr. Sergey told me that screws are special only available for certain producers and that is why I should not disassemble it.

After all, we both found a solution. Together we modified existing screwdriver so that it could fit to Mellisa. Later, we managed to open it. To open a hair dryer was not easy task either, because plastic frame had snap connections. A damage while opening an object was inevitable.

I managed to take it apart and turned the dryer from the inside. The problem was the outside switch which fall apart from inside mechanical switch. So both of them did not have any contact. The main problem was that a section witch was holding an inside switch was broken. It means that to replace a part you need to replace almost half of the body of Mellisa. The only solution I found was just by using a super-glue to glue switches and hope that they will never be break apart again.

It was not so easy, but I managed to repair it.
It looks bad, but it is functioning.

I returned it to its owner, but owner said that she does not need it anymore, because she bought a new one, but she appreciated my efforts to fix it. I was a bit too late and all the blames goes to that mysterious non standard screws. Since it took a while to fix it.
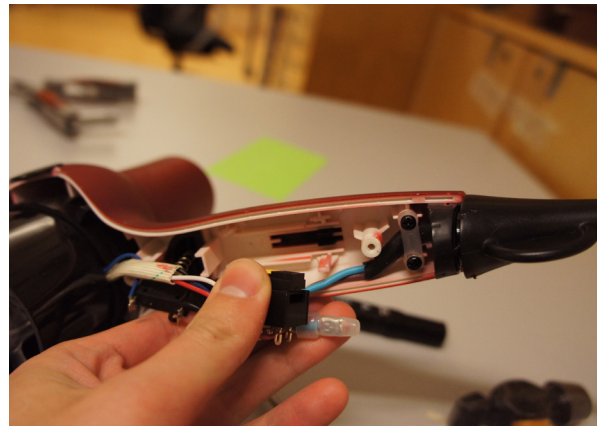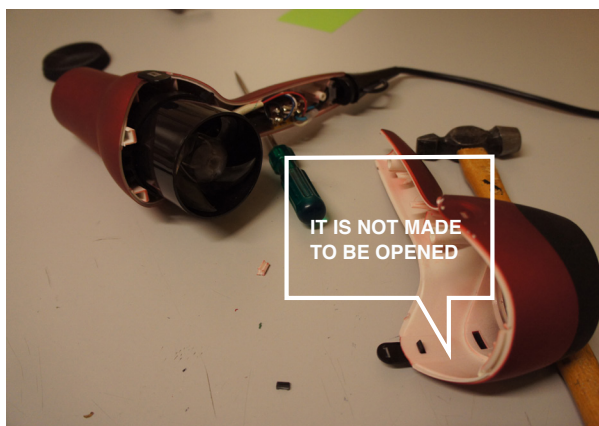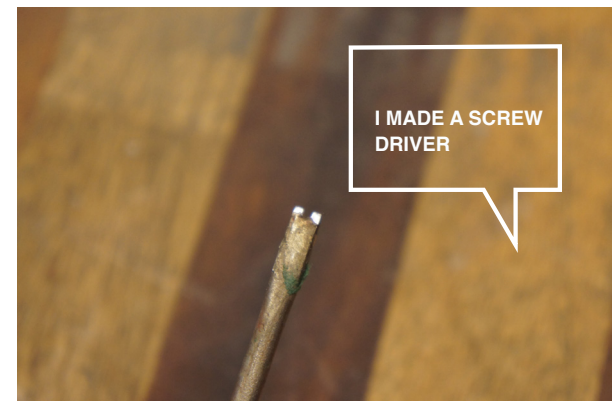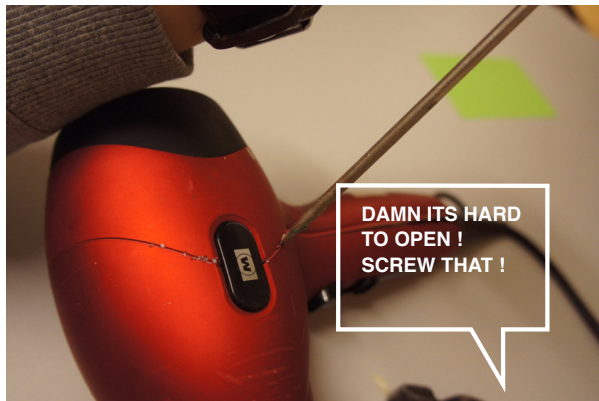
2.4 HEADPHONES

For the next step, I tried to repair my headphones. The company is Zumreed it is Japanese manufacturer and focuses on young audience with affordable price. Its design looks very mainstream. It offers headphones with lots of varieties of colors and simple design. What I mean about simple design is that all headphones has clear geometrical shape, oval and rectangular not too sleekly as some of the mainstream looking headphones.

I bought it in Korea for more or less 20 USD. Quite cheap compared to Beats headphones witch costs 300 EU. Of cource quality is very low. You get what you pay for. They worked pretty well. Fusion between traditional structure and mainstream design that was an attribute what I like the most about it. It was also a souvenir from my trip to Korea. Unfortunately they did not last for long. Nevertheless, I still liked it. I wanted to keep it, because in Sweden you could not find the same in the market. So I stared to repair it.

It was not so difficult to rip it of. With a small screw driver everything could be taken apart. Next, I was surprised how such a small and tiny object could have so many parts. Also had to be aware of losing one of its tiny parts. After I dismantled everything I realized that wire contacts were not the issue which means that driver is ruined. Since there are no service center for this specific headphones and no available replacement parts I had to forget about getting it fixed.
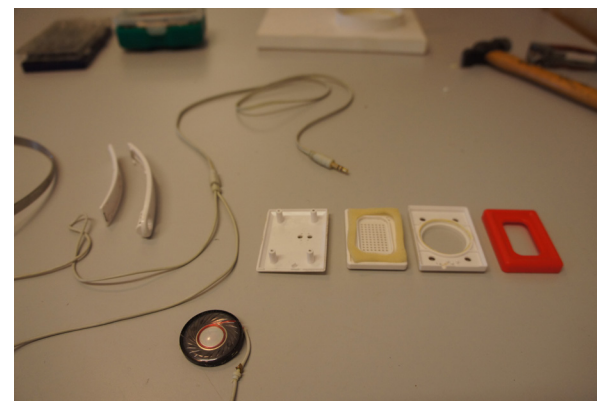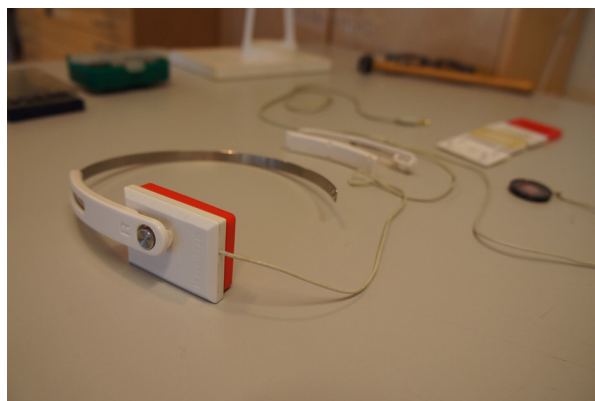
2.5 REPAIRING MY OLD CAMERA.

Lets go for more advanced object. Like my old broken digital camera model: Canon S5 IS. It still photographs ,but LCD screen lost a contact with camera. Luckily I found a forum in the internet. One guy ended up with the same problem as me and posted his repair process in Youtube. He advised me to buy a LCD part from the internet and just instal it.

I have tried to go for maintenance service few years ago, because the warranty period was still available, but service told me that free warranty service does not applies to LCD damages. To get it fixed in the center I would have to pay 40 EU.

I think that is ridiculous. It means that before manufacturing company does not take responsibility for the most fragile parts in case they get damaged such as screens. After buying a camera it seems that I have agreed with those conditions as well. The problem was nobody informed me about it. Maybe there is a section mentioning in a deep manual about terns and conditions about LCD part, but please tell who reads all that manual before buying any kind of a product. Usually I always assume that within warranty period full service of maintenance will be provided, but not part of it. This is insane.

Anyway Canon lost my trust, now I do not care if they promise good quality products any more. Simply it

made me angry. Few years later when I had enough money I bought Sony. It is amazing how bad customer services can ruin a whole image of a brand to me and probably that implies for other users as well.

After reviewing a video clip in Youtube and buying a spare parts online I managed to fix a camera.
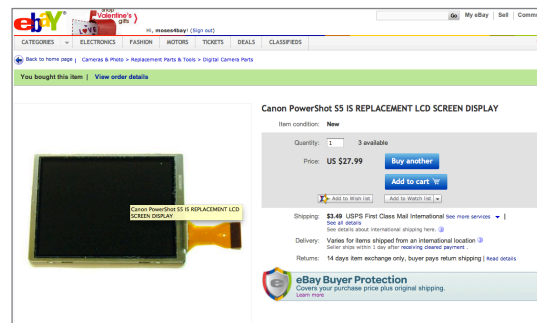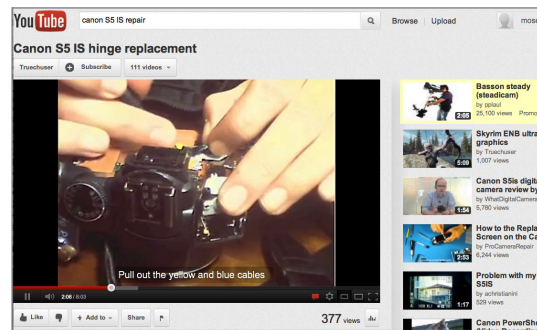
2.6 ENCOUNTERING WITH BROKEN BRAUNS MASTERPIECE.

I was lucky that I found this beautiful drip coffee making machine. Maybe for ordinary user this coffee maker could be not so much appealing, but for industrials designer like me BRAUN is a magical brand. Of course since Gillette bought the company design of BRAUN became horrible (this is my and my friends from Germany opinion). Why it is magical? Its because of Dieter Rams of course. Everybody in our school appreciates his design. He is like design grandfather to us. Everybody wants to become like him and everybody wants to accomplish as much as him. He is even inspiration for Apples designer Jonathan Ivy. His 10 principles of design are like 10 commandments from Bible.

"Good design is innovative
Good design makes a product useful
Good design is aesthetic
Good design helps a product to be understood
Good design is unobtrusive
Good design is honest
Good design is durable
Good design is consistent to the last detail
Good design is concerned with the environment
Good design is a s little design as possible"

– Dieter Rams –

Well the truth is that personally I really had enough of him. Nowadays, when we face ecological crisis in my opinion we need something more than those principles.

Like something "Design should serve for everyone" or "Design should nurture our nature", "Designed should address well being" It seems that those ten principles still work but its not enough to save our world. Like those 10 commandments from Bible, I guess it was not enough to save humanity and that is why Jesus had to come to save us? isn't it? According to Bible it is.

It is the KF series of coffee maker. The most successful coffee maker of all time. The KF-40 model was released in (1984) by Kartwig Kahlcke set the design tone for an inexpensive, functional yet beautiful daily object. Indeed the KF-40 model alone had a global market share of 10.1 percent. Seven years after it was launched these coffee makers have been the subject of many business school classes on design, development and marketing. Moreover it also has a label "Made in Germany" not "Designed in California and assembled in China" I guess it is 20 years old. In a sense if it is made in Germany it means that it is more sustainable and more quality product than Apple.

A Braun coffee machine was extremely easy to repair. Because my friend from Finland (a guy who knows everything) told me that he already had problems with same model few years ago. He told that coffee machine is extremely simple. The only thing you have to do is to fasten a plastic tube to stop water leakage. It was true. I opened, fasten those plastic tubes in order to secured a water flow. It worked! A water

does not leak any more. Now we can enjoy a coffee in our studio made by Braun coffee machine. How awesome is it? In Lund Sweden, a country of moist, cold, strong winds mixed with snow and rain nothing can better than hot cup of coffee inside your warm studio.

An error was very simple to fix . After that you start thinking how many objects are just thrown away even though a problem is very small and sometimes it just takes few minutes to fix it.

ENCOUNTERING WITH BRAUNS MASTERPIECE

PROBLEM: WATER LEAK

WOW, MADE IN GERMANY !

THANKS JERE. ITS A GUY WHO KNOWS EVERYTHING.

ITS THOSE WATER TUBES CAUSING A LEAK.

JUST FASTEN THOSE WATER TUBES YOU STUPID!!!

ENJOY

When I work at school and started repairing stuff and everybody who passes my desk start commenting or asking. Sometimes it can very annoying. People start saying that it is easy , you should do like that and so on…Ye sure, I know, theoretically everything is easy. Then why don't you do it instead if you guys know everything. The thing is that most of the people know how stuff works and how to repair stuff, however not everybody dare to make it work.

Even collecting all that shit was not that easy, dude! First, I had to go e-waste collecting containers like a hobo and look for waste when it was -13 C outside. Second they are dirty and not everybody dare to touch it. When I have repaired a coffee machine not everybody dared to drink a coffee from it. Further more, if you look at Mellissa hair dryer it required lots of efforts for only opening it even though theoretically I knew that error was minor.

So please do not tell me that it is easy, and what I am doing here is not a big deal. Its like saying that system thinking will make world better living place, Yes I know and everybody knows that, but who is actually contributes towards industrial revolution?

Ok, lets stop all those emotions and concentrate on work. In a opposite way comments are very useful. What I am going to miss the most from our school is the information exchange. We chat, we giggle, we make fun from each other sometimes create whole drama out of nothing at the same we exchange ideas and learn from each other. Even the most stupid ass hole whom you hate the most, can influence you by only him being next to me. In every conversation you can find at least small pease of gold. You just have to be humble and process that information in a useful manner.

2.7 SAMSUNG MONITOR

Next, I was dealing with Samsung monitor model: Syncmaster 214T. My German friend found it and tried to repair, but he did not succeed. It seems that monitor is pretty complex object to deal with so I called computer repair service Itel.se. They specialize on computer maintenance. I called and found out that it is pretty expensive to get it fixed. Itel.se would charge me 500 SEK for checking it in and the rest of the price will depend on error. If it is a minor problem probably it will costs an extra 200 SEK. But in case they cannot fix it I still will have to pay checking it in. According to service it will take more or less a week to repair it.

At the same I asked if I could do an interview with one of the workers about whole process of maintenance. About how they deal with components and which brands are easier to repair and so on, but unfortunately they did not like the idea. They claim to be too busy. According to my Swedish friend, girls are always more successful at making telephone calls. In a busy office full of electrical engineers girls are always welcome. Sometimes it is ridiculous how stuff goes around our society no matter if it is Sweden or Korea. So at first I had to find a girl with fragile and feminine voice.

Well damn about that monitor and repair service. I will make it work by my self. I do not need any help anymore. Internet is my best friend now.

Internet knows everything and it helps anytime. Like for my Canon camera I looked up at the website "Corporate Computer" tech support & repair guides, part sales. Website had tutorials exactly for the same model as my monitor. It explained major problems through youtube video. A tutorial was right. My monitor had a blinking power light and dark picture on screen. They offered me to replace capacitors. Good news was that website also offered basic tools and replacement parts for fixing at a reasonable price. It cost me 14 USD in total.

Finally the parts arrived and tools were ready as well. I have watched repair video again and just followed as they showed. The problem was a power board. 5 Chinese made capacitors were worn out. So the only thing what I have to do is to replaced them with new Japanese made capacitors. Dismantling a monitor was not so difficult. I took of power board and replaced capacitors with de-soldering iron. I assembled everything back again, powered monitor and it worked. It took me 2 hours. A process was fun and pretty relaxing. It was really worth.
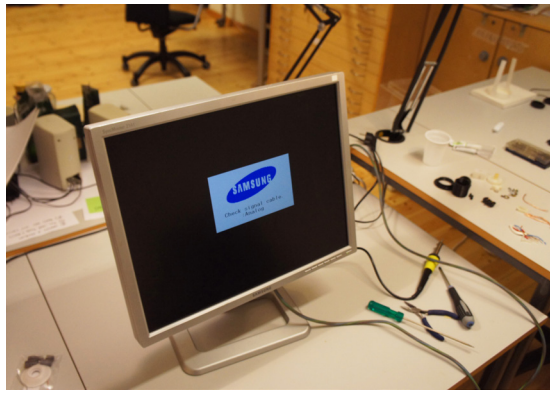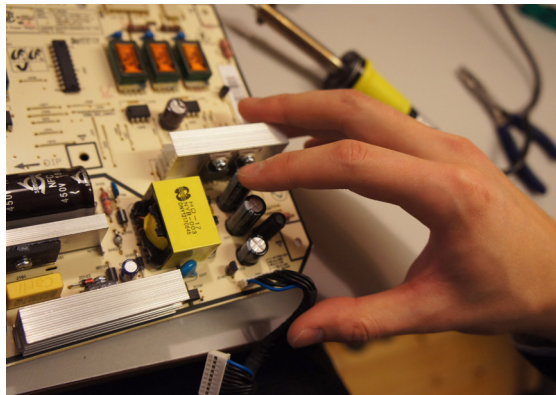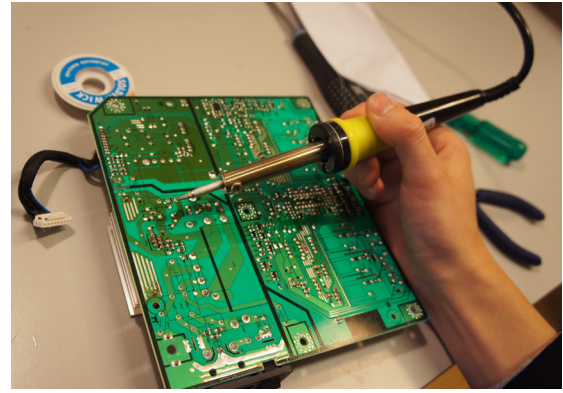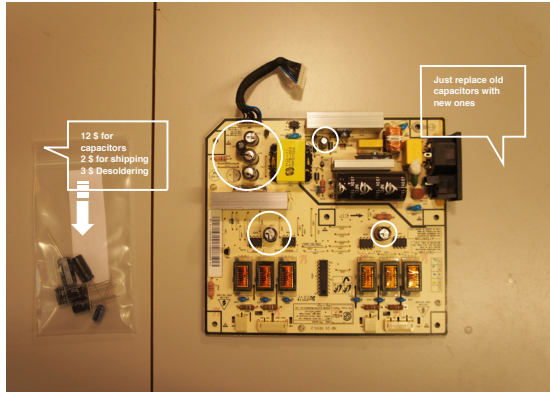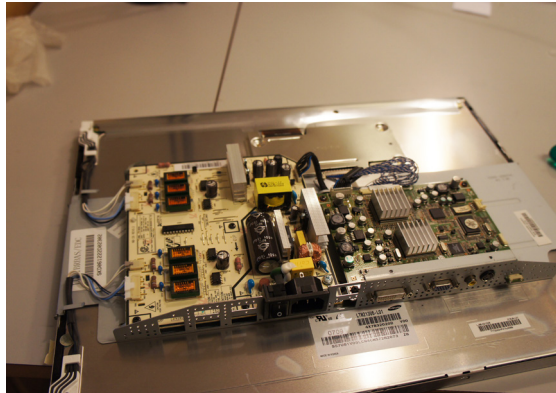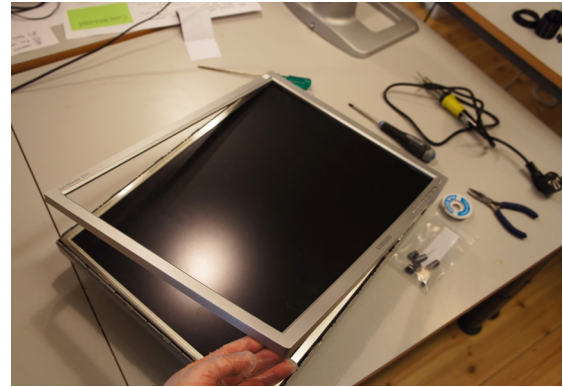
2.8 CONCLUSION FROM THE FIXING EXPERIENCE.

Fixing was fun. Especially when you get something fixed and others are happy about your job. I also gain some knowledge about products and I think now I am pretty confident about fixing stuff. A fixing research phase was definitely worth executing. The experience I have gain can be implement to my project more in a direction how product should not be designed and how I would design a product. So here is my conclusion. Non of the products were designed to be maintained by a user. A structure is fixed, parts are in low quality , materials are easily torn down. Every part of a product is designed to last a certain amount of time. If you need help from services it is not worth it. The only thing you can trust to get a reliable help was internet.

DIFFICULT TO TAKE IT APART.

A structure of almost all objects are fixed hard so it is very difficult to take them apart. In some cases a damage while taking apart was inevitable. That is because the most common technique to join a plastic is snap feature. Snaps are molded in feature that allow parts to join by interlocking which are designed in to molded part and take advantage of flexibility of plastic. A method allows for the quick assembly of parts at a very low cost. The worst plastic joining technique was gluing. With some efforts snaps give up to be opened, but in case an object is glued properly you have to forget about taking apart parts without a damage. The best plastic joining method is fastening with screws. It allows parts

to be dismantled for repair or recycling. However, some objects like a hair dryer which I have repaired was fixed with non standard screws so it took some time to find right tool to take it apart.

LOW QUALITY PARTS

Parts are made in a very low quality and fragile. Majority of objects had problems on switches or On/Off. On/Off buttons which are the most interacted by a user. In my opinion switches or On/Off buttons should be given a special attention before reaching customers. Switches are fragile and they are not repairable. Replacements for that are not always available. The next common error was in the electric wire connections. After the usage wires and electric boards loose contact. For that You will need basic knowledge, tools and of course be aware of electric charge. Sliding and hinge parts are also one of the most common areas of breaking. Probably all electric and non electric parts of interior was carefully calculated to last only fixed period of time. Some stuff, especially objects which generates heat are not recommended to be opened due to a safety.

MATERIALS

The most common material is ABS. If plastic brakes there is no way you can put it pack properly, unless you use your creativity to fasten parts by exaggerating bro

ken area. Plastic also sucks all the dirt around you after a while. But ABS is known as a material with high impact and mechanical strengths used in durable consumer and industrial products. The only thing what was is missing was that parts are not durable enough or modular enough to be replaced by something else. Spare parts are not always available as well.

STYLE

Style or Look. Fashion makes a model out of date. Make it fashionable. It is a very simple rule worth following if you want to make a product not desirable after certain period of time. My advice if you want make lasting product - Do not follow fashion !

A TIGHT CONTROL FROM PRODUCERS

Forget about getting proper service then your object is out of warranty. There are not many repair centers who does not belong to a big brands at least in Sweden. If service is available they going to charge you a lot and you will start doubting about making an investment for your old gadget. Most of the brands do not allow third parties to do a service instead, because of the copy rights. It is also very difficult to run a service company without support from big corporations, because spare parts for old products does not exist any more in the market. It seems that big companies also are taking part of controlling infrastructure to make maintenance service unavailable for users.
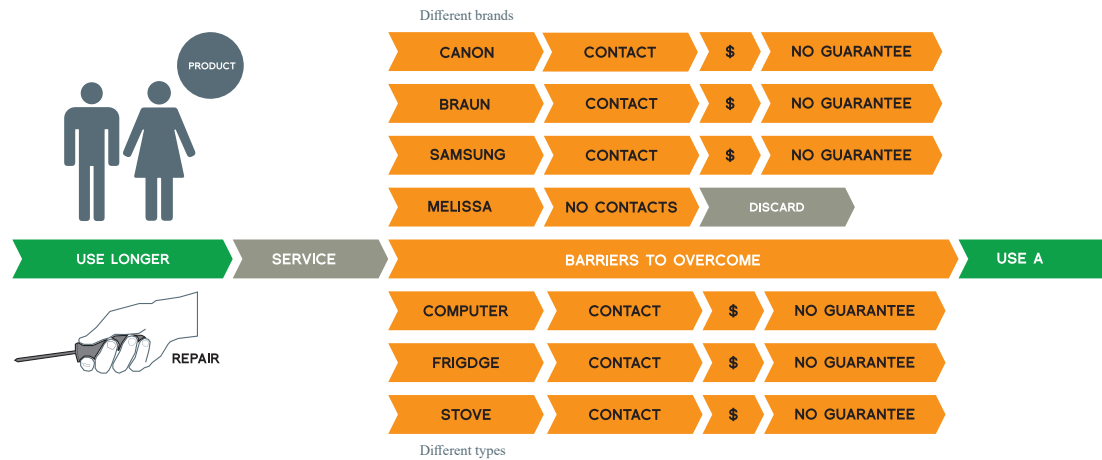
Graph 2.0
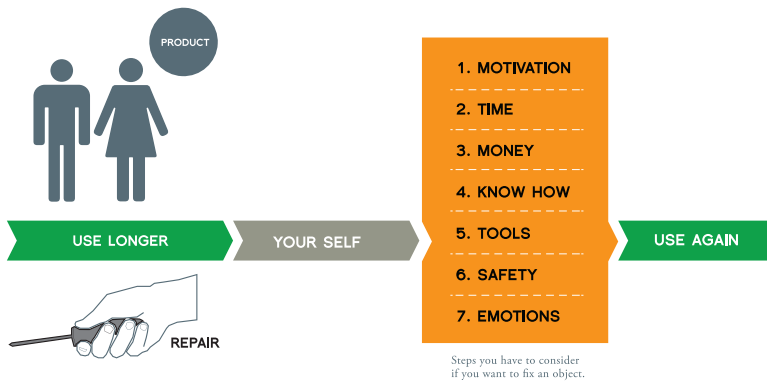
Graph 2.1

DIFFICULTIES USER FACES BY RELYING ON CUSTOMER SERVICES CENTERS

It is a challenge for users to get a satisfying mainte-nance help from service. It takes time and costs makes user to doubt to keep old object or buy a new one. From the producers point, to enrol maintenance services is a challenge as well. The simplest way for any producers, to eliminate any extra work after a product delivery, is simply design a product not worthy to repair. It seems that both parties have difficulties to find a proper com-promise. How can we create a system were both user and producer can benefit from fixing?

A graph 2.0 shows the barriers user has to overcome in order to get object fixed relying on service centers.

BARRIERS USER HAS TO OVERCOME TO GET STUFF FIX BY THEM SELVES.

A user buys a new product since maintenance is not worthy of an investment. A user can try to fix stuff by himself. From my experience everything is fixable, but you have to put some efforts to it. There are numbers of difficulties user has to have in mind in terms of time, money, knowledge, tools and safety issues.
How can we eliminate those difficulties?

A graph 2.01 shows the barriers user has to overcome in order to get object fixed by himself.

USE LONGER | YOUR SELF | MORE INPUT

PRODUCT

1. MOTIVATION
2. TIME
3. MONEY
4. KNOW HOW
5. TOOLS
6. SAFETY
7. EMOTIONS

Steps you have to consider if you want to fix an object.

MORE VALUE | USE AGAIN

REPAIR

Graph 2.2

FIX TO KEEP

INTERNET
A bridge between user an producer

FIX FRIENDLY PRODUCT

PRODUCER

Graph 2.3

BENEFITS BY FIXING STUFF BY YOUR SELF

There are number of benefits when you fix objects. For sure, it is cost effective and good contribution to sustainable living. However there is more than that. When I got my objects fixed, I have gained a knowledge and emotional value is gained as well which very satisfying. You are not only bringing object back to life, but also adding an extra value to the objects. The products gain personality in other words products become a little pease of your self. There fore, the more efforts you put, the more valuable objects become. I guess not everybody has realized that. So how can I express that in my object?

A graph 2.2 shows that fixed products gain more value after the maintenance by user
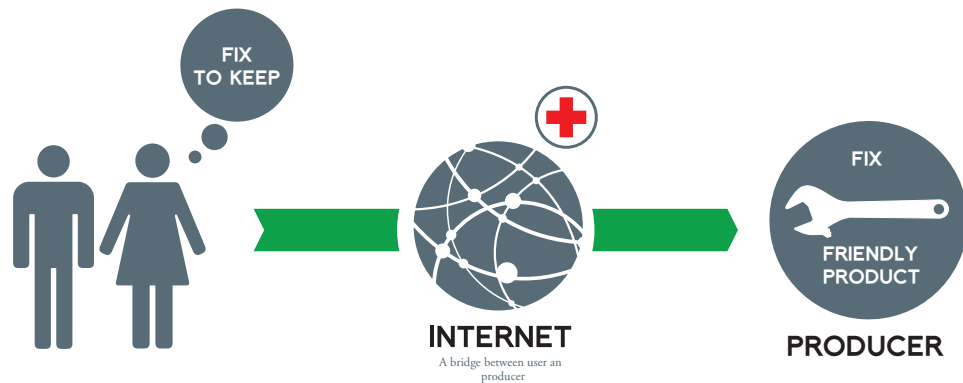
WHAT COULD WORK ?

Producers has to design objects repair friendly, easy and modular enough so that user can act independently. The knowledge can be gained through internet. Internet platforms should offer fun and easy access the information. Internet is a good tool to eliminate a knowledge gap between user, product and producer to make quality product. Users have to have a mind-set to keep their belongings for a longer period and not to be afraid of fixing.

A graph 2.3 shows that user has to have a mind set to demand for better products and producer has to react to it by providing fix friendly product. An internet could work as a bridge between user and producer.

3. RESEARCH PHASE 2

Second stage, was about case studying people or organizations who are rebellious against our society related to my topics. In this time of financial and ecological crisis I am pretty sure that I can find a lot of people who think as me and already have started to go for responsible or independent development and life style.

A second stage also includes some literature readings to gain solid theoretical background and to add more holistic thinking to my project. A literature is mainly focused about product development. "Cradle to Cradle" is about sustainable development. "New Product Development For Dummies" is about traditional methods how to develop a new product. "Growing Modular" is about efficient development towards mass customized products for future users. A book "System Thinking" gave me insights how to tackle an existing system towards changes. These readings made me to think more holistically and apply more systematic thinking to my design process. Furthermore, readings also gave me a clear understanding about the role as an industrial designer in the ocean of product development.

"
Pre-industrial craft system?

3.1 THE ORIGINS OF CAUSE, PLANNED OBSOLESCENCE

How we ended up in a society were objects are not repaired anymore? Is it part of what industry has created or result of customers demands ? Is that our mental state to always demand for cheap and new instead of trying to keep and maintain your belongings? Is that good or bad? Where mass consumption is going to lead us? Should we as a designers promote mass consumption or not? Well a documentary "Light Bulb Conspiracy" says that it all started with Planned and Perceived Obsolescence initiated by industries.

PLANNED AND PERCEIVED OBSOLESCENCE

Online encyclopedia says that planned obsolescence or built-in obsolescence in industrial design is a policy of planning or designing a product with a limited useful life, so it will become obsolete, that is, unfashionable or no longer functional after a certain period of time.
A policy is beneficial for a producer, because strategy obtains consumers to buy products again and again since products are designed to last for certain period of time or become unfashionable anymore.
Consumers are under the pressure now. American industrial designer Brook Stevens in 1954 said "planned obsolescence is instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary." First time a term was introduced in 1932 after the industrial revolution was in its peak

and reached mass consumption culture. Today its very common for industries to base their business strategy on that policy.

ADVANTAGES AND CONTRA VERSES

Every company nowadays wants to generate long term sales by shortening replacement cycle. To approach this strategy it requires more additional costs in research and development. Companies also have risk since consumers can buy products from other competitors. However, if a company wins over its competitors the reward is certain. Another big advantage is that strategy drives technological advances. By actively developing replacements companies can keep up with current competitive market share as well. A fact that Planned and perceived obsolescence drives technological advancement is controversial since lots of companies postpone technological improvements. Take a sample of how every year consumer electronic companies launch their products only with minor improvements instead of revolutionizing whole product.

DIFFERENT TYPES OF OBSOLESCENCE

There are even different types of planned obsolescence. Functional or techninacal obsolescence when products have expected average lifetime and making cost of repair comparable to replacement cost or even not serviceable anymore. Planned functional obsolescence

is a type of technical obsolescence in which companies introduce new technology which replaces the old.

Systemic obsolescence is achieve by altering the system infrastructure in which products exists making a user more difficult to say in older system. We can find a perfect sample in new software which does not supper older program. Another way of introducing systemic obsolescence is to eliminate service and maintenance for a product. A third parties are even forbidden to offer maintenance because of copyrights.
And it also very difficult for third parties to enrol repair service centers since parts of older products are not available anymore.

Everybody are familiar with style obsolescence in other words called fashion. Introducing new products with different style and making a model out of date. Mobile phones, automobiles and especially clothing industry is riding on that cycle.

Notification obsolescence which the product informs the user when it is time to buy a replacement.
Like in water filter displace a user is imformmed that filter is out of fuction even though its still working. Inject printers uses specific smart chips to prevent it for second hand usage even though it still contains some ink.

OVER CONSUMPTION IS A NATURAL HUMAN BEHAVIOR

There are many supporters of planned obsolescence which think that system is driving power of innovation and economics. In Korea where I come from where all countries industry is based on innovation of electronics goods, continually changing electronics is tolerated in the society. It is not only about Korea its about our world where consumerism refers to economic policies placing emphasis on consumption. Over consumption phenomena is as old as the first civilizations like ancient Egypt, Babylon or Rome. A desire to possess wealth a far beyond basic needs existed since a human was born. A fight against the greed also has existed. In Acient Greese Rome, Asia and Middle ages societies had a Sumptuary law which suppose to regulate habits of consumption. A modern age consumerism was criticized right after it started, however it seems in most of cases and places, they were infective. That is why most of the Ancient civilizations collapsed and I guess our modern civilization is a next victim of human greed.

" A desire to possess wealth a far beyond basic needs existed since a human was born.

TO FIGHT AGAINST GREED IS ALSO A NATURAL HUMAN BEHAVIOR

Planed obsolescence works best when a mark is least influenced by middle class business industries - oli gopolies. Also when market is competitive product life spam increases. For the most of the societies planned obsolescence is acceptable, however it can both provide many negative issues. Continuously replacing instead of repairing create wastes, pollution, depletes natural resources and increases unnecessary consumer spending. If consumers get involved on preventing of being a victim of a system, they have can do it by becoming tech -gigs who try to repair products for longer usage or not get involved on fashion cycle. In a society where consumers dictate the economic structure the choices users make can make a difference.

However, today when we face both ecological and financial crisis the ideas to prevent addictive consumerism is more active then ever before. Anti-consumerist activism draws parallels with environmental activism, anti-globalization, and animal-rights activism in its condemnation of modern corporations, or organizations that pursue a solely economic interest. There should be something that goes against Planned Obsolescence.

" In a society where consumers dictate the economic structure the choices users make can make a difference.

3.2 REPAIR CULTURE STILL EXISTS ?

Is public reacting to industries planned and perceived obsolescence? Well at least in my environment its not. It gets more and more hard to get your stuff fixed unless individuals become a tech geegs. However, as I mentioned before a movement against immoderate consumerism has started right after industrial revolution. "The Theory of the Leisure Class" in 1899 written by Thorstein Veblen, Chicago was one of the first detailed critiques of consumerism. In a contemporary society when we face ecological and final crisis the anti-consumerism movement is in his peek.

A RESPONSE FROM MASS MEDIA

Before the start I have watched numbers of documentaries related to anti - consumerism movement.
On of the first one was a "Light Bulb Conspiracy".
A documentary explaining about industries planned obsolescence. Then "Story of Stuff" a 20 minute clip explaining about our linear system which should be changed in to more sustainable world. Next was "The Fair Wear Formula" by Fair wear foundation. Their mission is to improve labour conditions garment workers around the world and finally a clip about "Design for Repair and Upgrade" by Autodesk which stands for more useful life of our products. It encourages product developers to design products repair and upgrade friendly for sustainable world. There are tons of thousands of information related to sustainability and that even can make you sick.

REPAIR CULTURE DOES EXIST

Repair culture does exists. A topic of recycling was very popular few years ago, but it seems recycling is becoming not cool anymore. All supporters of repair culture claim that recycling sucks and everyone should repair or reuse belongings. The most popular repair community is Ifixit. The company sells repair parts and publishes free wiki-like online repair guides for consumer electronics and gadgets. Founder Kyle Wiens aims to reduce electronic waste by teaching people to repair their own gear and offering tools, parts, and a forum to discuss repairs. Recently iFixit has launched Dozuki to enable others to use iFixit's documentation framework to produce their own documentation. Dozuki guidebook is a modern procedural documentation platform. Guidebook makes it easy for anyone to create how-to instructions or publish service documentation for complex devices. Every manual is available online, as downloadable PDFs, through dedicated mobile apps like iFixit's iOS app—or through custom API applications. Ifixit community is commercially successful compared to other repair enthusiast organizations.

SUB CULTURE

There are other less commercial organizations which promotes fixing. Like "Platform 21" In Netherlands. A semi artistic community with their own repair manifesto which organizes various kinds of events related to fixing. Platform 21's events are opened for public, but if you go to their website it seems that most of the participants are artists or designers. There is also artist gathering community in Melbourne Australia. Pretty much the same movement as "Platform 21", but less popular. It seems that US is leading in commercializing ideas like for instance Ifixit. Non of the other platforms have not reached as many public as Ifixit.

FIXING IN DEVELOPING NATIONS

In a developing world like in Ghana and some areas in China etc. repairing is very natural phenomena. Repair services are not restricted by copyrights and people even fix for living. My classmate from Vietnam told me that in her country it is very cheap and easy to get things fixed. In a developing world for some people repairing stuff is a necessity. In a developed world people have more know how about stuff, but minor people take actions, because simply it is not a necessity. Since I am focusing my project on developed countries I am not going to go deeper about fixing culture in a third world countries. I am focusing on our society there I grew up and live now .

There are more stuff going on expect for repair culture, which is DIY and Makers culture. I exclusively made a a separate page about it since I want related my project it.

3.3 DIY ETHIC AND MAKERS CULTURE

DIY and Makers culture is alternative consumption culture to modern mass consumption phenomena. When I started exploring a repair culture, I felt that ethics of self sufficiency is disappearing. Nobody knows how to maintain their belongings and its not only about our everyday products we use. It applies almost to all aspects of our life as food, clothing, services and mass media. Everything now is so specialized and corporative that people are extremely dependent of each other than ever before. What if suddenly our system collapses? If food industry stops producing food will anybody know how to bake bread from the scratch? What if suddenly oil stops flowing from the ground? However if you browse a bit you find that anti consumer movement has been going on since the industrial revolution. Like 1900s "Arts and Crafts" movement in United States or DIY culture in late 1960s in UK opposing industrialization and modernization.

DO IT YOUR SELF

DIY ethics is about self efficiency. Its about completing any kind of a task by your self instead of using professionals. It promotes that ordinary person can do more than he was educated for. I am talking about a programer becoming a plumber or gardener when it is needed. Or Designers not only sketching and doing 3D models, but also capable doing stuff outside of your field of expertise. In Wiki I found a sentence which explains exactly what I want to say:

"DIY is central to the ethic is the empowerment of individuals and communities, encouraging the employment of alternative approaches when faced with bureaucratic or societal obstacles to achieving their objectives"

The phrase "do it yourself" came into common usage in the 1950s. A movement is directed to urban and suburban dwellers. It is re- introduction of the old pattern of personal involvement and use of skills in upkeep of a house or apartment, making clothes; maintenance of cars, computers, websites; or any material aspect of living Wikipedia says. The philosopher Alan Watts says

"Our educational system, in its entirety, does nothing to give us any kind of material competence. In other words, we don't learn how to cook, how to make clothes, how to build houses, how to make love, or to do any of the absolutely fundamental things of life. The whole education that we get for our children in school is entirely in terms of abstractions. It trains you to be an insurance salesman or a bureaucrat, or some kind of cerebral character."

MAKERS MOVEMENT

Makers is a modern movement which came up from DIY. Compared to DIY , Makers rely on technology like electronics, robotics, 3D printing and CNC tools which become more and more available to public. The "Maker Movement" has been around since 2005.

Followers of Maker culture think that it will shape the future and as most of the those previous anti industrializations movements a Maker culture are credited with the recent economic slowdown and a growing rejection of mass consumerism focused on middle class.
The maker movement aims to be democratic, with an emphasis on the equal connection between the user, the creator, and the product. Most blueprints and basic modeling software are available online free of charge - an open source technology. 3D printers are one of the most popular technologies in the maker movement. The possibilities of 3D printing is growing. From a small scale it might be applied to buildings, biotechnology, agriculture and even in military.

DISCUSSION

I relate my project very close to MAKERS and DIY movement. I came up with this project because of my growing rejection to products offered by our society. Why do I have to replace my belongings every 2 or 4 years? Why do I have to follow all that fashion? Why products cannot be modular enough and repairable enough to last longer at least 5 or 10 years. What if a system collapses and nobody will know how to make stuff for basic necessities. DIY and MAKERS movement has also started because of the same rebellious reason.

3.4 HOW MUCH DIY HAS GONE SO FAR

A REVIEW OF OPEN SOURCE ECOLOGY MOVEMENT

One of the the most interesting active personas I found was a farmer and technologist Marcin Jakubowski from TED Talk. He started an Open Source Ecology movement which is an open technological platform that allows for the easy fabrication of the 50 different Industrial Machines that it takes to build a small civilization with modern comforts. He started a platform because he had a feeling that science was too closed off from the worlds problem.

HOW HE STARTED

He finished his studies in PHD in fusion energy and discovered that he was useless. He started farming, bought a tractor and it broke. He paid for repair and after a while it broke again and finally he broke himself. A low costs tools that he needed to maintain his farm did not exist in the market. He needed tools that were robust, modular, highly efficient and optimized, made from local and recycled materials that would last a life time not designed for obsolescent. He felt that he had to build everything by himself. He realized that industrial productivity can be achieved in a small scale. Then he published everything online and all over the world people started doing a project provided with information from Marcins open source.

He sees a huge potential for mid class business who can start a construction business, parts manufacturing, organic CSA. In a TED talk a Marcin shows what he has achieved so far. He has planted 100 trees a day, made 5000 bricks a day and build a tractor in 6 days. He sees a huge potential on open source hardware technology which will explore what all people could do and discovered the limits of human potential.

OPEN SOURCE ECOLOGY

Open Source Ecology is now a network of farmers, engineers and supporters, whose main goal is the eventual manufacturing of the Global Village Construction Set (GVCS). As described by Open Source Ecology "the GVCS is an open technological platform that allows for the easy fabrication of the 50 different Industrial Machines that it takes to build a small civilization with modern comforts." The devices themselves are built and tested on the Factor e Farm in rural Missouri. The Factor e Farm is the main headquarters, where the machines are prototyped and tested. The farm itself also serves as a prototype. The residents grow their own food, collect rainwater, and produce all their electricity by solar panels.

LATEST ACHIEVEMENTS

So far they managed built 4 machines out of 50 and released a Civilization Starter Kit, a training material how to start an independent Global Village. They have a core team and many fans. Soon a documentary about Open Source Ecology will be released as well.

DISCUSSION

An Open Source Ecology movement is so far the most interesting sample which shows that small scale industrial revolution is possible to achieve by group of knowledgeable people by using modern day technology available for mass public. I see a parallel between my project and Marcin Jakubowskis movement. Of course his actions has gone far beyond compared to my project. He needed tools that where robust, modular, highly efficient and optimized, made from local and recycled materials that would last a life time not designed for obsolescent. So do I. My project is also about going against obsolete products. I want to design something robust and modular - repair friendly enough object so that a user can act independently with his belongings. The only thing is, if I should act as hippy as Marcin Jakubowskis and claim a total isolation from our society or should I stay in our system and try to change it.

open source ecology

http://opensourceecology.org/

3.5 CAN FIX FRIENDLY PRODUCTS BE APPLIED FOR BUSINESSES ?

A REVIEW OF A BOOK "GROWING MODULAR"

Growing modular is a book about modular business and mass custumization for industries. A book tells that industries missing link is configuring modularized products to take a full advantage of the new global economy and e-comerce. An author gives insights that small or global enterprisers can fully benefit in the global market through modularization and mass customization using modern day technology. This book gave me an insight that going modular or go for "tailor-made" pre-industrial craft system production can actually work for modern day business at the low cost and provide both flexible and stable industrial development.

In a book author states that mass customiziation is a crucial part for the future development since economic and political changes is constantly removing trade barriers which leads to more increased competition. Secondly, an improved education and access to information produces costumers that are both cost- conscious and demanding. Third, modular strategy leads to more sustainable development- sufficient use of natural and human resources. Since going modular is long term thinking it requires cross - departmental commitment and cross-functional vision - in simple words a great team work.

BENEFITS OF MASS CUSTUMIZATION STRATEGY.

1. Mass custumization is a key to being a global com

petitor. As companies grow of their home market, mass customization enables companies to easily adapt to a global market.
2. Mass Customization can extend product life cycle. Reusing modular components designs across product lines and product generations is a key technique.
3. Modular Products are the best method of mass customization. A modular product can be adapted and modified to meet a specific customer's needs. Mass customization also enables an enterprise to start selling systems rather than single products.
4. It is committed to create a positive customer experience. Customer is a driving force and along with that comes innovation. Innovation naturally drives mass customization and configuration.
5. Mass customization has become easier compared to 1980. Technology is now at a point of maturity where it can truly enable the intelligent customer dialog and communication that is a pre-requisite for Mass Customization. Web can unleash its global potential and to make it serve the customer at a sufficient level of flexibility and intelligence.
6. The Road to Customer Intimacy- Offer a close cooperation with the customer. Mass Customization in contrast, truly does "treat different customers differently"with each customer having their needs met individually. It also increased loyalty and life-cycle revenue due to an improved dialog with customers .Customer Relationship Management (CRM) is a current approach emphasizing the benefits of focusing

on "share of customer" rather than "share of market". Thus, Mass Customization increases customer loyalty (and revenue) by responding to customer needs and by providing the customer with flexible products with extendable life cycles.
7. Easier service and upgrade over time, in addition to the loyalty induced by more personalized customer response.
8. Thus, Mass Customization minimizes losses by delivering better quality of customer contact. Up to 65% of time could be spent changing orders, 17% correcting errors in orders, leaving just 18% to be spent in normal sales & marketing work.
9. Companies need to quit worrying about the future and take on strategies to exceed their customers' expectations for mass customized products. Exceeding customer expectations with mass customization is the best investment in a solid future.

"

Mass Customization can extend product life cycle.

"Modular products are the best method of mass customization.

"It also increased loyalty and life-cycle revenue due to an improved dialog with customers

CONCLUSSION

According to author "one-size-fits all" production will be out dated. Companies who realize the potential for customization will emerge as market leaders. Industries have to focus on mass customization which leads to modular production and close customer relationship management by using technology to keep it in a low cost. Mass costumization leads to sustainable development since product are modular which increases product life cycle. It also increases customers loyalty due to a quick respond to customers needs.

It also needs less amount of natural and human recourses since a modular platforms are very adaptable for different needs with in the global market. There fore going modular requires cross - departmental commitment and cross-functional vision, however as soon as companies gain momentum companies can quit worrying about the future and focus on delivering products which exceeds customers expectations. The key market for modular industries is the ever-growing middle class who are demanding and price-sensitive.

DISCUSSION

In a process of my thesis I have been thinking that my project is rebelling against the big industry.
I have related my self as a promoter of rising Maker culture who acts against the system, since I am designing a product who promotes responsible production and reseponsible consumption which contradicts to most of the products I am surrounded with. However, it seems that modular product development can be fitted to mass business as well which can work in favour for environment and people. According to author there are already some industries who applies customization strategy and are very successful such as Sciania Trucks or LEGO. The problem is that not every industry applies or adapts to it and of course not everybody thinks in a sustainable way. I also agree with an author that it is not an easy task since it requires a lot of united people from multidisciplinary background - a good team work.

A lot of companies already have adapted platform approach of manufacturing. Different companies have different definitions for a term " platform" Some use it to describe a technology that can produce many different products or parts of products. An example is the ink jet printer. The printer's developers save tons of time and

money by not having to invent many different products. Some low cost and low function products even contain the Some low cost and low function products even contain the added functionality of high - priced products.

As a result, the modular system is used not in a sustainable way. Instead of producing quality and repair friendly object the companies are in favour to planned and perceived obsolescence. Think about printers even though most of the companies base their production on platforms, they end up making more rubbish in a more efficient way. Modular and customized business thinking depends on companies vision. Companies can end up producing even more obsolete products in a more efficient way with help of platform based business model.

Then, how companies can adapt modular business model in a sustainable way? Maybe with principles from"Cradle to Cradle"?

3.6 WHAT IS A SUSTAINABLE PRODUCT?

A REVIEW OF A BOOK "CRADLE TO CRADLE"

In the first chart of the book the author recounts our past and recent industrial revolution. That industrial revolution was based on oil and other non renewable energy resulting on intended and unintended consequences, That people seek profits not regarding surroundings and the nature.

The book goes further by explaining how industry nowadays try to be sustainable. Most often its just being a bit less bad rather being truly ecological. A a lot of companies use label ECO as a trendy marketing trick by only adding a tiny fraction of what is truly ecological. For instance adding a label ECO on beef package and making it recyclable does not really change everything. If you want to be eco-effective you have to produce products with systematic thinking, by considering a clean energy, clean materials, well being of labour work, sustainable distribution which makes clean profit for people and nature. The book it self focused more on wastes and it radically offers to eliminate concept of wastes.

"To eliminate the concept of waste means to design things – products, packaging, and systems – from the very beginning on the understanding that waste does not exist. It means that the valuable nutrients contained in the materials shape and determine the design: form follows evolution, not just function"

"Cradle to Cradle" - page 104

TWO DISCRETE METABOLISMS

A Book indicated that there are two discrete metabolisms on the planet. The first is biological metabolism or the biosphere - the cycles of nature. The second is technical metabolism, or techno sphere - the cycles of industry. With the right design, all of the products and materials manufactured by industry will safely feed these two metabolisms, providing nourishment for something new.

DIVERSE BUSINESS MODELS

The author also emphasis on diverse business models instead of traditional capitalistic model based only in profit. It is commercial companie's responsibility, to provide increase wealth, but not at the expense of social structure and natural world. Author would call it Economy/ Economy sector. If a company wants to move over towards more stable approach. It should go to Economy/ Equity sector which is money goes together with fairness. Fairness of employees wages, treating workers with a respect.
The third sector goes with Ecology sector with both mentioned sectors. So its is Economy/ Equity/ Ecology sector. Involving a profit, fairness and obeying natures laws. The third sectors goes not only with a respect of workplace or home, but respect to ecosystem with a question Is it fair to pollute the air and river?

STEPS TO MAKE A SUSTAINABLE PRODUCT

In a sum up of the book author offers some practical advises towards possible solutions. Here are five advises how products has to be produced.

1. Begin to turn away from substances that are widely recognized as harmful is the most individuals and industries take first as they move towards eco effectiveness. Bear in mind that positively selecting the ingredients of which products is made, and how they are combined, is the goal.

2. We know little about what they are made of, and how. And based on what we do know, for the most part the news is not good; most of the products we have analyzed do not meet truly eco-effective design criteria. Yet decisions has to be made today, forcing upon the designers the difficult question of which materials are sound enough to use. As a metaphor we cannot put off cooking until perfection has been achieved. it a huge step, but we have to begin somewhere. There are ways to do best.

3. Respect; respect those who make products, for the communities near wear it is mad, for those who handle and transport it and ultimately for the customers. Prefer delight, celebration, and fun. It is very important for ecologically intelligent products to be at the forefront of human expression. They can express creativity, adding pleasure and delight to life.

4. Question yourself: Are they problematic? Are they toxic? Carcinogenic? how is the product used and what is the end state? What are possible effects on the local and global communities.
Positive lists of a product.

5. Activate positive list: Stop trying to be less bad and start figuring out how to be good. Activate eco- effective principles become food for either biological or technical metabolism. Throw the recipe out the window and start from scratch, with basket full of good ingredients. design a car for disassembly, so that materials can once again be a nutrient available to industry. Encode all the ingredients and give up cycling passport, that can be read by scanners.

5. Reinvent. Reinvent the car – so that it could be nurturing car.

DISCUSSION

" Cradle to Cradle" was inspiring. The book is more about thinking different rather offering a direct solution to a global problems. It inspired me to apply more to systematic thinking rather than focusing on traditional method of designing a product. Instead of focusing on style, usability and traditional manufacturing, maybe I should also add more aspects to my project.

In the other hand, to have very sustainable project is very interdisciplinary. It requires lots of other expertise in chemistry, work labour, distribution an so on. At least my professor Olof told and warned me not to end up with another product with only assumptions how it should be created according to a theory. That approach will not give any substantial insights and project it self will be not so interesting. A theory of " Cradle to Cradle it self is not new and the book was published in

2002 and similar theories around the world has already been available since 1971 in a book " Design for the real World" by Victor Papanek.

How should sustainable product look like?
A graph 3.0 shows it.

With a right design, all of the products and materials manufactured by industry has to safely feed these two metabolisms, providing nourishment for something new. Businesses should adapt diverse model of development. Involving a profit, fairness and obeying natures laws.

Graph 3.0
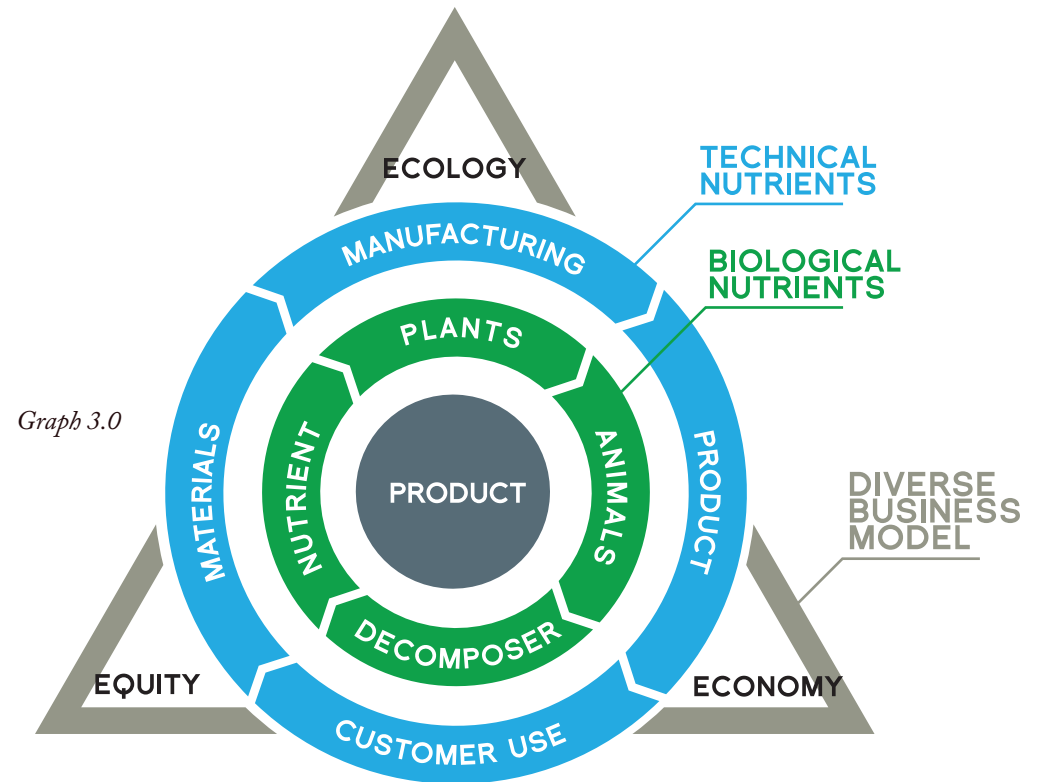
3.7 CONCLUSION FROM RESEARCH PHASE 2

The two research phases were both useful both practical way and theoretical way. From the phase 1, when I repaired object by my self I have a lot of insights how product should not be designed and also realized a missing ling between producer and user to make repair friendly objects in to existence. The second research phase gave me a theoretical knowledge that modular and repair friendly products can exists not only for the DIY, Maker subculture, but also for business.

REPAIR FRIENDLY OBJECT

Objects has to be modular and repair friendly.
An object has to communicate with a user that it is not meant to be for a short life spam and to give an opportunity for a user to interact when repair is needed. A producer has to bring those objects in to a existence. Users have to collaborate as well, by having a mind set that products can last long and not be afraid of deeper interaction with a product in terms product care and repair. A good tool to eliminate a knowledge gap between two parties is internet. It can provide know how and create intimate relationship between producer and user for the sake of long lasting products.

A SMALL SCALE INDUSTRIAL REVOLUTION

With a technology available for public. There is a possibility to start a small scale industrial revolution.

By having an access of knowledge how to make product and access for tools to make it, there is a possibility for people to start producing their own goods. That is what DIY and Makers culture are trying to do now. There lots of enthusiasts who support that concepts and some of it has became in to reality, however, it is still very far for mass public to adapt its thinking.

MODULAR BUSINESS

Modular business has a huge potential at least according to sources I have encountered. It is a very efficient and flexible way to base your business strategy and to sustain a company for a long term. It saves resources, it can easily adapt to market and trends changes. Modular products can also provide long lasting products and adapt to different needs of a customer. A strategy has a potential to make an equal connection between the user, the creator, and the product. It would be even better if business also base modular strategy in a eco- efficient way as in a book "Cradle to Cradle".

MY ROLE AS A DESIGNER

On the way of this project, I always was asking my self How and What I can contribute to the ocean of product development as an industrial designer. For sure, I am a product creator and I play a vital role in establishing an intimated connection between user and products. By designing a product I should represent a responsible production and responsible consumption.

Producers and politics always can take actions to produce better products, but final decisions always comes from public. Often public is not ready to adapt new concepts and changes. Take a sample of the situation I have encountered outside of my department. I come to people with this beautiful repair friendly concepts and ask what people think. People from different disciplines say that they would not do that since products are so cheap now and it is fun to buy new things. There fore, ask your self, are they willing to be more responsible consumers? Are they willing to pay more for long lasting product and contribute to the world of well being? It is very important to raise public awareness towards more responsible consumption. If public demands more quality products, industries are always ready to react to it.

I should design a product which says for industries go for repair friendly products. For public I should tell a message that taking care of your belongings is fun and worthy in many aspects. In the next phase of a project I will try to come up with concepts that tells the story of fix friendly products and fun way to repair stuff.

4 RESEARCH PHASE 3

Inspiration

It was about understanding how and what people fix. Since reaching a target who fixes stuff is very complex process a second research stage was entirely based on internet. Luckily through internet I understood that fixing culture is not gone yet. Through different kinds of forums and blogs I could not only gather some useful data, but also I get inspiration for my concept.

An overview of my chosen object

I have chosen headphones to apply my concept. Therefore, a brief product analyses has been done. Functional and production methods analyzed together with a method how product is designed. An interview was made with a junior designer with expertise related to headphones.

Make it cool !

4.1 FINDING AN INSPIRATION FOR MY PROJECT.

OBSERVING HOW AND WHAT PEOPLE REPAIR

Information I have collected is based on competition organized by community "Platform 21" in Amsterdam. Since 2006 a community in Amsterdam established a laboratory where creative people gather and initiate exhibitions, research projects, workshops, lectures, discussions and club nights. The aim of the platform is to stimulate creative amateurs and professionals to share a knowledge. Sustainability, well being , creativity and fun in the areas of cooking and repairing is the most common topics they are focusing on.

HOW DIFFERENT PEOPLE REPAIR STUFF

Recently on their website they presented the results from repair competition. So far they have received 60 entries from all over the world, but most of them where from Dutch both involving public and designers.
A contest is called "Most Remarkable Repair Contest". People could repair basically anything and post on the on line . A winner was defined by its creative way to fix stuff by a jury. What I liked about competition results was that most of the participants were not designers, but public. Even the jury was a collection of creative people from different fields such as hotel owners, tool tester and editors. By observing a competition results, I processed information in to data to help me to gain some new insights and add a bit of a color to my design process. And for sure it helped me a lot. I categorized 60 entries in to 4 different categorizations. Categorization by type of product, categorization by fixing method

and finally by gender. The results were surprising. The most interesting fact was that women were dominating in a field of fixing. From 60 entries 65% were female members and the rest of them were male. The most common repair technic was sewing, patching and knitting, which is related threads and wires. Obviously, the most common type of products was clothing. People also repair furniture by using patching and knotting techniques. Taping, screwing are used for furniture as well. After the furniture a moderate amount of electronics, tools and mechanics related products such as bikes were published as well.

Overall, women are winning in game of fixing with their favorite sewing method. There fore, people tent to fix wood, mechanic related products. In my opinion everything is possible to fix, but it seems that products made out of fabric, wood and mechanics communicates with audience that it is fixable. Contrary a plastic products are not in favour for fixing communities.
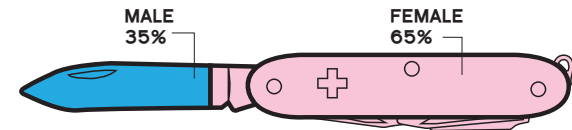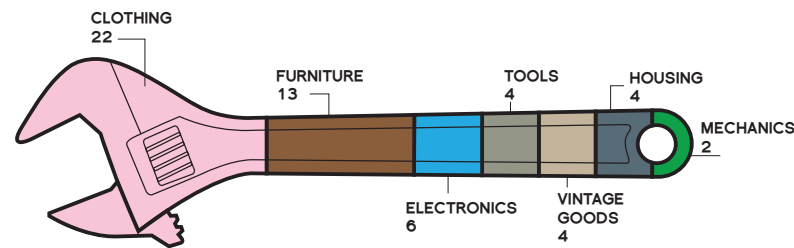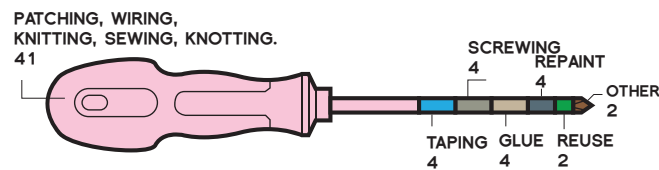
DISCUSSION

Observation how and what people repair was inspiring . First I got a glance how and what people repair stuff. Surprisingly women are more repair active than men. The only difference between female and male members is that women to repair more stuff related to clothing or upholstery. The methods female use is mostly wiring, knitting, sewing and patching. This adds some color to my project since it was about to become to manly. To make a modular product is quite obvious. You add some screws and make easily to build and take it apart. However, I was looking for more alternative ways to express modularity and it seems knitting and patching method could work. An object that I want to create does not necessary has to adapt LEGO characteristics. It has to communicate for both female and male members. Second alternative is to do something wood. Third alternative is to come up something with leather. There are mid level businesses who work with wood and leather around Lund. A product can adapt to mid class business to support them instead of supporting multinational companies. Fourth, direction I could take is mechanical design, but I think It is too obvious approach.

I was inspired by this method of research I definitely would like to use those finding to my product.

Most common
objects people repair

CLOTHING
22

FURNITURE
13

TOOLS
4

HOUSING
4

MECHANICS
2

ELECTRONICS
6

VINTAGE
GOODS
4

MALE
35%

FEMALE
65%

Female are more active
in a field of fixing

PATCHING, WIRING,
KNITTING, SEWING, KNOTTING.
41

SCREWING
4

REPAINT
4

OTHERS
2

TAPING
4

GLUE
4

REUSE
2

Most common fixing
techniques

Graph 4.0

40

4.2 WHY HEADPHONES ?

According to my research findings I am going to design headphones. Why headphones? Because it is a product which most of people in my age have, and most of them admit that they break. Second, It is a fashion related products and product of self expression witch leads to shorter life spam than any other products. The product is simple, there fore, there are no needs to educate people how to use it and give understanding of its structure.

" Headphones are the good sample of a result of planed and perceived obsolescence.

A FRAGILE PIECE OF DEVICE

Everybody admits that headphones break and everyone is willing to buy a new pair instead to of fixing it. The first reason why they break is because it is highly mobile device. We wear it while we walk, run and jump. It is not tightly fixed to our bodies as a watch so it often result in falling down or crushing in to other objects. It also interacts a lot with our body. With our head, ears, neck and hands. Simply, a term "Wear and Tear" is more common to headphones compared to a computer or a toaster. I can relate headphones very close to an object which belongs to planned obsolesce category.

FASHIONABLE

It is very fashion influenced and it is a product of self expression. That means in a short period of time headphones will become not desirable any more. A mainstream fashion also dictates the quality of a product. Its structure and materials have to be chosen for a cheap price to make affordable for middle class customers. Since it is a cheap device, there are no guarantees for maintenance. It is a good pease of sample which belongs to perceived obsolescence category as well.

A SIMPLE STRUCTURE

The simplicity of a product makes user to instantly recognise its function and structure. It has a potential for a user to understand it and try to fix it. It is a safe product when it come to an interior. Even though, It is related to electricity it does not require specific safety conditions as for home appliances like toasters or coffee machines which generates high heat.

DISCUSSION

For a conclusion, its good that I have chosen headphones. It is simple and safe. It has a potential for users to engage on its maintenance or even for self expression. I am going implement my research findings and create a model as a sample for industries of how object could be designed in order to make user to be more engaged to its life cycle. Since a self service is pretty common in our society nowadays to make people to fix stuff on their own with a little help from customers service centers should not be too difficult.
A fashion is what I am not going to focus on. My object should not promote a mainstream fashion. It will rather promote fixing fashion and trend to keep an object forever or handling it to a second hand user. Most likely I will come up with real working model.

" Simple construction can allow a user to built or maintain without facing any difficulties.

4.3 HEADPHONES

WHAT IS A HEADPHONE?

Some basic technical research has been done in order to build working model or at least try to understand the technology and structure of my chosen product. What I found out about Headphones is that its miniaturized version of loudspeakers fixed to our years. It is a device which converts electrical energy in to sound throw process of magnetism. Both exterior and interior part of headphones are important to make good sound quality. Since a device is mounted on a strap that clamps firmly over our heads its very important to meet ergonomic standards. A weight of a device is also an important aspect to consider not only to meet ergonomic standards but also for mobility. A weight cannot exceed 500 grams. In case of headphones are heavier than 500 grams it has to have structure to meet the ergonomic standards for comfortable to use.

A DEVICE FOR CONSUMERS AND PROFESSIONALS

Head phones are used for both consumer sector and professional sector. In professional audio sector headphones are used in live situations by disc jockeys with a DJ mixer and sound engineers for monitoring signal sources. In radio studios, DJs use a pair of headphones when talking to the microphone while the speakers are turned off, to eliminate acoustic feedback and monitor their own voice. In studio recordings,

musicians and singers use headphones to play along to a backing track. In the military, audio signals of many varieties are monitored using headphones.

CLOSE BACK AND OPEN BACK HEADPHONES.

There are two main types of headphones close back headphones and open back headphones. Close back headphones are designed so that no sound could escape and get in to headphones, while open back are open in the front and at the back. Close back headphones provide better sound quality because sound waves are not interfered by external parts, however much of the noise will leak in to the space and most likely it will distract people. Nowadays there are also noise canceling headphones, with built in microprocessor which blocks the exterior noise by converting it into silence or music, however these requires a chargeable batteries and whole structure of a product becomes a complex pease of electronic device. More simple way to reduce external and internal sound leak could be achieved by simply implying sound absorbing materials such as foam or wood.

MANUFACTURING

Headphones are made by a combination of hand and machine methods. The internal speaker configuration on the headphones must be wired first before being placed in the headphone casing. This is generally done

in an assembly line manner with several workers being responsible for a small part of the process. One worker may wire the speaker configuration into the headset while another may be responsible for just assembling the parts of the pre-molded casing. Most headphone casings are made by machines to save time and money. The outer casings of most headphones is made of molded plastic and thus created by a set of molds at the factory. After a pair of headphones has been completely assembled they are tested in the factory. Nowadays the testing is done by a computer. The computer program sends sound waves through the headphones to test the frequency response.

INSIDE HEADPHONES

Interior parts of : Driver or speaker part (The magnet, the coil wire, the diaphragm cone that makes sound, small chip), stereo wiring. Exterior parts: an adjustable headband strap, headpad, Housing, Slider, ear pad, frame, audio cord with 3.5 mm TRS plug. Materials: In Early ages: rubber, leather, copper, and technical ceramics. In mass production era: sophisticated plastics, silicone, artificial leather, rubber, textiles, vinyl and foam materials.

4.4 DESIGNING HEADPHONES

How do designers design headphones? I have over viewed a little bit of how designers tackle a task when it comes to headphones. As a sample case I took a studio Designit, the biggest design studio in Skandinavia and probably the biggest studio in Europe in terms of staff members. I have red some their briefings and inter- viewed one of their junior designer. Since some of the facts are a bit confidential the names are not mentioned here. However, I have understood that approach to design then it comes to headphones are very traditional. Like in every consumer product they focus on market and brand identity.

BRAND IDENTITY

The understanding among companies of importance of product identity strategy has increased significantly. The competition for an attention is intense and companies are eager to make sure their products do not fall behind when it comes to appearance and support of the brand, according to Designit .
Developing strong brand awareness is most important. The challenges, which might companies be facing is a merger or an acquisition of leaving the company with entirely new portfolio often completely unrelated to a brand. The first challenge when facing such a challenge would be to identify the design values and translate those values into defining principles for a new design'", says Claus Jepsen a partner and director of product design at Designit Denmark.   It is extremely difficult

to translate the various design elements in to the new product if you do not have a general expression of the design values. There is a lot of talk about signature elements but they are difficult to transfer from a TV or cell phone. Depending on what kind of company it is, how board its portfolio is and in what industry it is in. The majority of companies will benefit from brand consistency.

"

Developing strong brand awareness is most important.

CMF - COLOR, MATERIAL, FINNISH.

CMF method places a crucial role to design.
"CMF is a specialized area of design that focuses on color, material and finish development. This involves trend research, materials and processes R&D, analysis, strategy and lots of creative thinking." -Reiko Morrison, CMF Consultant. Color, Material, and Finish trends (often referred to as CMF) are the most widely tracked trends in the creative field. Whole organizations are de- voted to predicting (or rather proclaiming) what will be next year's hot colors or pattern. In the housewares and

fashion industries, for example, the Color Marketing Group meets yearly to coordinate what the next year's palettes will be. This is incredibly useful for a brand that manufactures for a retailer like Target, who wants to coordinate vast quantities of varied products into a cohesive color scheme. Materials trends are more rarely tracked, mostly in the architecture/interior design categories. Finish is even more rare, and involves the fine surface texture of a material (i.e. brushed vs. bead- blasted vs. glossy vs. matte). Therefore treating CMF in new and fresh ways is critical for creating differentiated products.

4.5 AN INTERVIEW WITH HEADPHONE DESIGNER

AN INTERVIEW WITH JR. DESIGNER

So far he was involved on designing 6 pieces of earplugs for such companies as Novero and Jabra.
1 product is on the market and 1 project is still on the phase of development. A method of interview was in more informal manner. I have not recorded or made any notes, but it was pretty enough to get in touch of how they design headphones or earbuds.

What are the most important factors for designing headphones?

"Styling and ergonomics are the main factors. Form language is dependent on companies identity and trend. To keep companies identity and still follow a trend is a challenge. Usually companies have their own identity of form language . CMF - is the main factor designers consider then it comes to design. It is more of an branding exercise. Ergonomics is the second aspect they are considering, but not to much, because it is also very defined."

" It is more of an branding exercise.

How about the technical stuff?

"Technical stuff is already defined by engineers and people who are involved in the production. Since, technically headphones are very simple a lot of focus goes to branding. "

Is there any other factors you consider?

*"Then it comes to professional sound equipment – the sound quality, functionality, robustness is important as well. Once he did headsets for Jabra company and the first thing they had to do was two weeks of research
in usability at call service centers. For a typical consumer market the sound quality and functionality does not matter much. Usually market research is more for trend analyses to make sure not to end up with similar product with another competitor. Some companies even have color patents so you have to be careful not to end up with a similar color as others."*

What design phases you had to implement while making headphones?

"Based on clients brief and target group which is already defined, they start sketching. It takes more less 3 –4 weeks to come up with final concept and most of the time they sketch or 3D model. Later, a concept is confirmed by clients and they proceed model making phase to validate concept. "

Finally, the main attributes then it comes to headsets was " Make it cool"

CONCLUSION

"Headphone is a product with high trend and brand awareness. There no technical challenges to consider since a product is very simple. A lot of attention goes to CMF design method. "

" Make it cool !

Notes : A Desinger did not work on earbuds design in full time. He had few more project going on in his office.

Note: The name of an interviewer is not mentioned since a subject wanted to keep this interview in a confidential manner.

4.6 A BRIEF FOR MAKING HEADPHONES

REPAIR FRIENDLY OBJECT

Objects has to be modular and repair friendly.
An object has to communicate with a user that it is not meant to be for a short life spam and to give an opportunity for a user to interact when repair is needed. A producer has to bring those objects in to a existence. Users have to collaborate as well, by having a mind set that products can last long and not be afraid of deeper interaction with a product in terms product care and repair.

DESIGNED FOR SMALL SCALE INDUSTRIAL REVOLUTION OR MODULAR BUSINESS MODEL.

A product should supports DIY , Makers movement and modular business mentioned in research phase 2.

ESTABLISH A CLOSE CUSTOMER AND PRODUCER RELATIONSHIP

A concept is to make an equal connection between the user, the creator, and the product for the sake of long lasting product.

EFFICIENT REPAIR IS NOT THE POINT

I want to emphasize that speed or efficiency is not my main focus. An opportunity to add value while building and maintaining an object is my main focus.
Some how I want to express that a moderate time investment in to an object can make it more valuable. So instead of offering an object which is very obvious to build or repair in a few minutes I would like to give a moderate amount of challenge. Take a sample of LEGO toys. They are modular, but to reach a final product you have to follow an instruction manuals which is a bit of a challenge depending on a difficulty level. In this way a final product gains an extra value. The challenges I have faced while repairing stuff in a research phase 1, in way was fun. The more time and efforts I put in to an object the more valuable an object became. However, I have to be careful not to make an object too challenging.

FIXING IS FUN

For public I should tell a message that taking care of your belongings is fun and worthy in many aspects.

FASHION AND TRADITIONAL MANUFAC-TURING IS NOT CONSIDERED

Market is not taken in to consideration. Instead of adapting to its current market and production methods my project has to be more conceptual. Like a fashion aspect, adapting to cheap and less material production methods will not give any freedom and further structural exploration for a device. As I mentioned before a concept will promote fixing fashion and trend to keep an object for a longer period of time. Although, I can not completely deny fashion since I assume that influence from todays environment to me is inevitable.
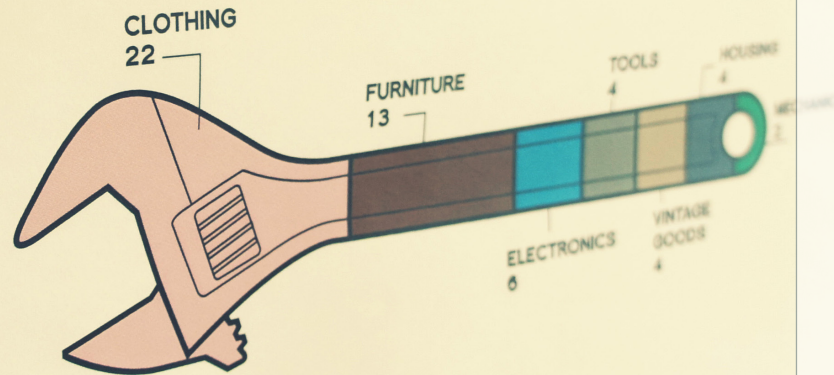
Materials selection in terms of ecology and economy will not be my main focus. Instead of recycling a concept will promote reusability.

5. CREATIVE PROCESS

5.1 INSPIRATION

MOST COMMON
OBJECTS PEOPLE REPAIR

CLOTHING
22

FURNITURE
13

TOOLS
4

HOUSING
4

ELECTRONICS
6

VINTAGE
GOODS
4

An inspiration was gained during a research phase 3 in section 4.1.

As I mentioned before women to repair more stuff related to clothing or upholstery. The methods female use is mostly wiring, knitting, sewing and patching. So maybe I could use some elements from that?

Second alternative is to do something with wood, since people do some wood work for leisure and there is a possibly to get help from the nearest wood workshop in case of damage. A third alternative is to come up something with leather with almost the same reasons as for wood.

Fourth, direction I could take is mechanical design, but I think It is too obvious approach.

5.2 FIRST CONCEPT

PAY ATTENTION
TO DETAILS
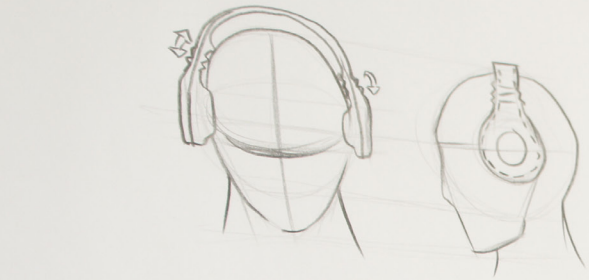OF SIMPLE
STRUCTURE

MECHANICS

SIMPLE MECHANICS

Simply applying standard screws in to an object could work as a repair friendly product. There should be ways to do it fun as well.

Mechanical elements communicates with a user that it is fixable. Take a sample of bikes or cars. Especially, bikes are perfect sample of a product category were user gets involved in maintenance.

REMEMBER
THE PAST

AVIATOR

5.3 SECOND CONCEPT

LEATHER

Leather products are long lasting and repairable. Leather goods can be treated and repaired by user as well. By buying leather goods user commits for long use. There are still lots of shoe or bag repair centers around the city. There fore, old leather products could support small individual business who runs a leather repair shop.
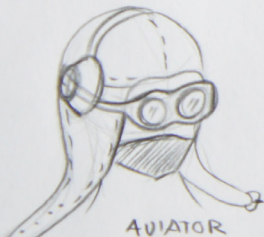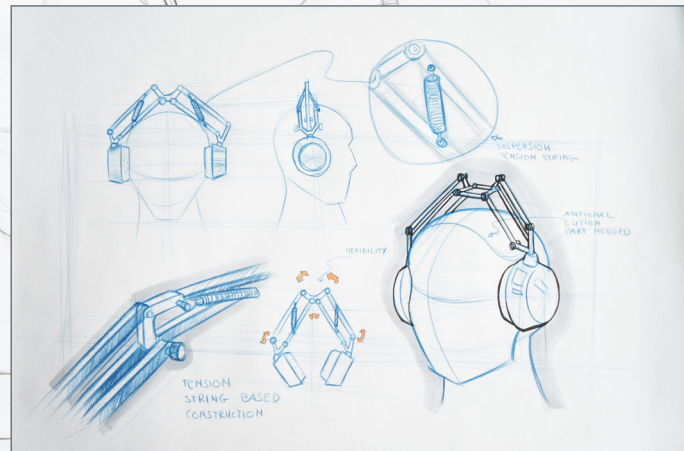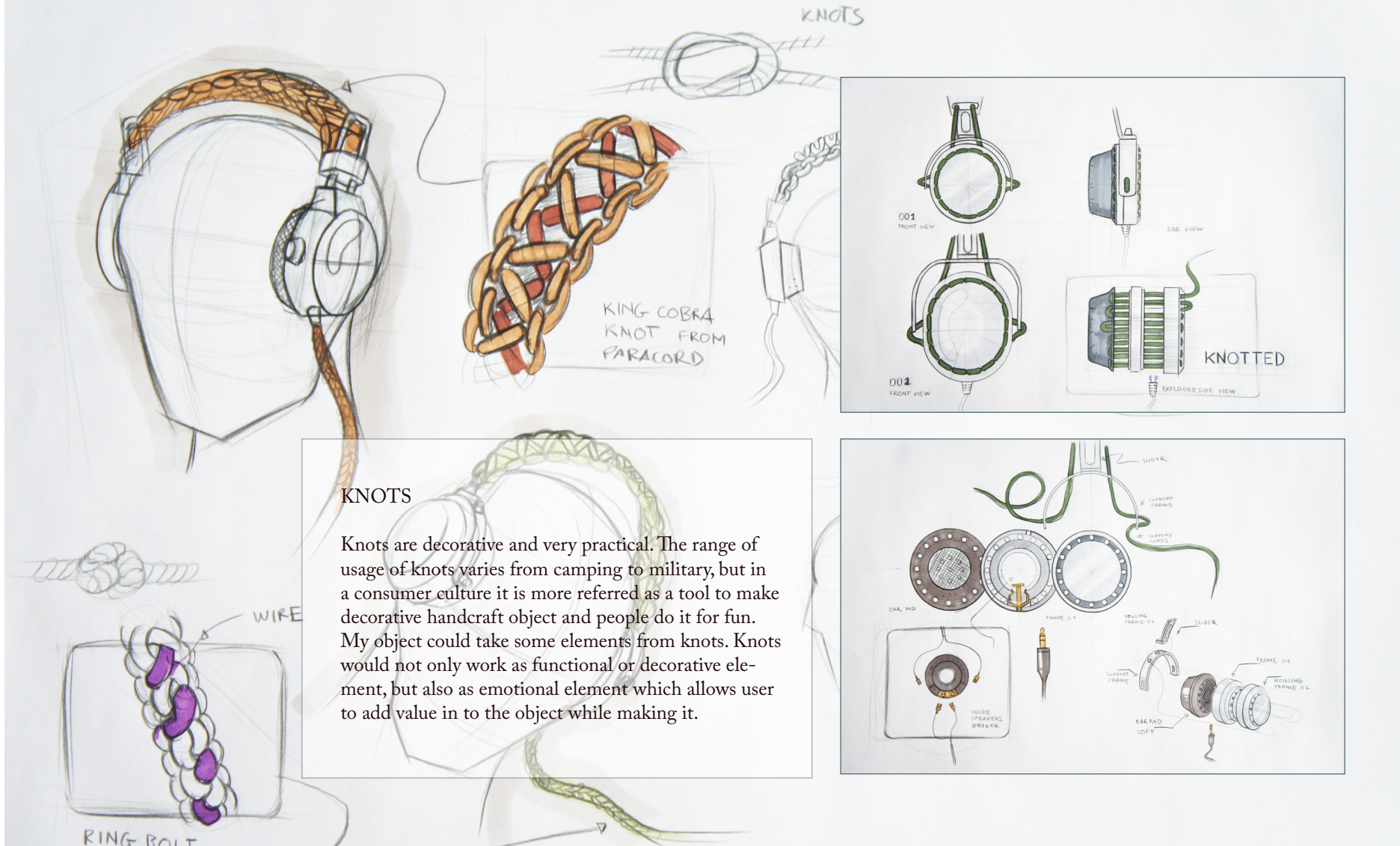
ADJUSTMENTS ARE HIDDEN

LEATHER

5.4 THIRD CONCEPT

PLYWOOD

KNOTS WORK
AS CUSHONING

WIRE
STRANSFER
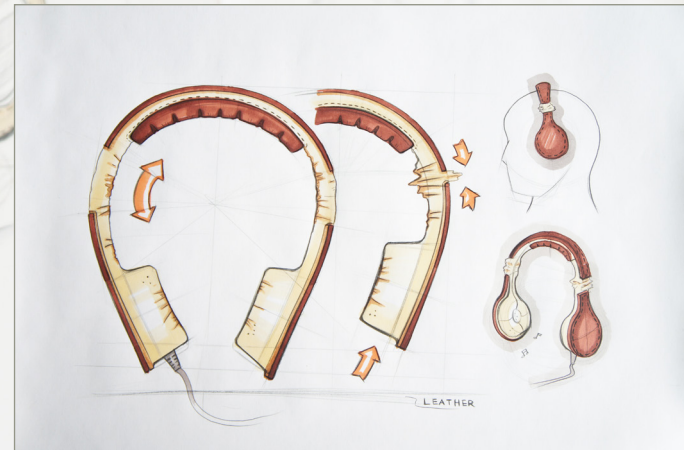
WOODEN HEADPHONES

A a term " Wear and Tear" fits to wood as for leather.
Consumers can fix wood or make parts them selves.
There are also a lot of wood craftsmen who can fix the
errors.

FRONT VIEW

LEFT VIEW

PERSPECTIVE
VIEW

WOOD AND
CRAFT

5.5 SELECTED CONCEPT

KNOTS

KING COBRA KNOT FROM PARACORD

KNOTS

001 FRONT VIEW

001 FRONT VIEW

SIDE VIEW

KNOTTED

EXPLODED SIDE VIEW

KNOTS

Knots are decorative and very practical. The range of usage of knots varies from camping to military, but in a consumer culture it is more referred as a tool to make decorative handcraft object and people do it for fun. My object could take some elements from knots. Knots would not only work as functional or decorative element, but also as emotional element which allows user to add value in to the object while making it.
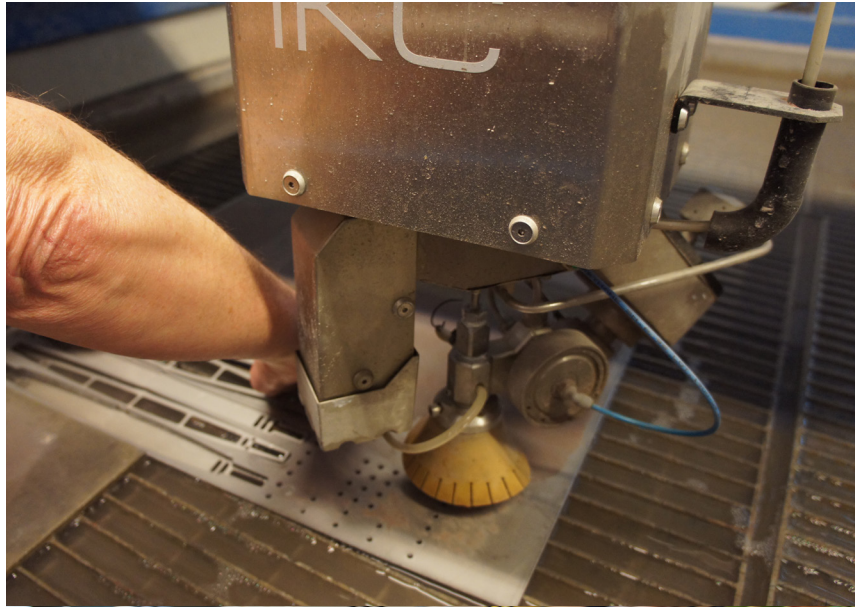
WIRE

RING BOLT

5.6 3D MODELING AND RENDERING

3D modeling stage. A chosen concept is taken to 3D modeling stage.
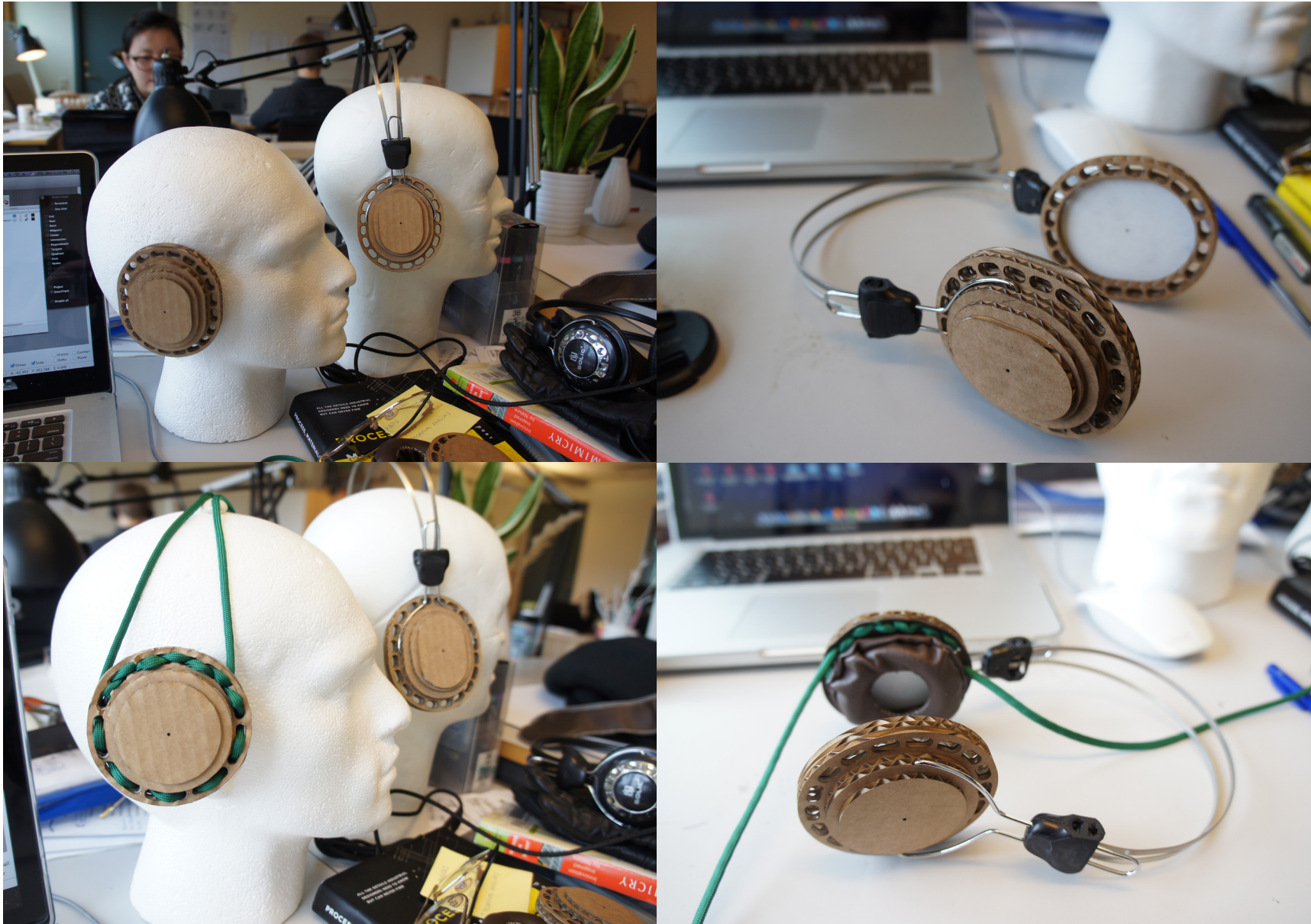
5.7 MAKING SKETCH MODELS

EXPLORING
THE POSSIBILITIES
OF KNOTS

I have learned how to knot and tried to apply the technique to regular headphones. The results seems very promising.
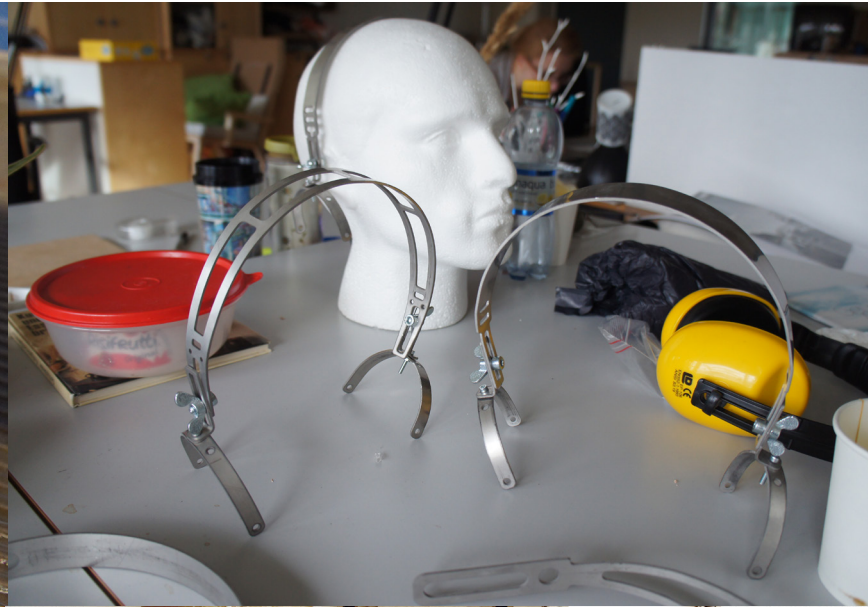
In the next stage I made some headphone sketch models to test the ergonomics and apply knotting technique further.
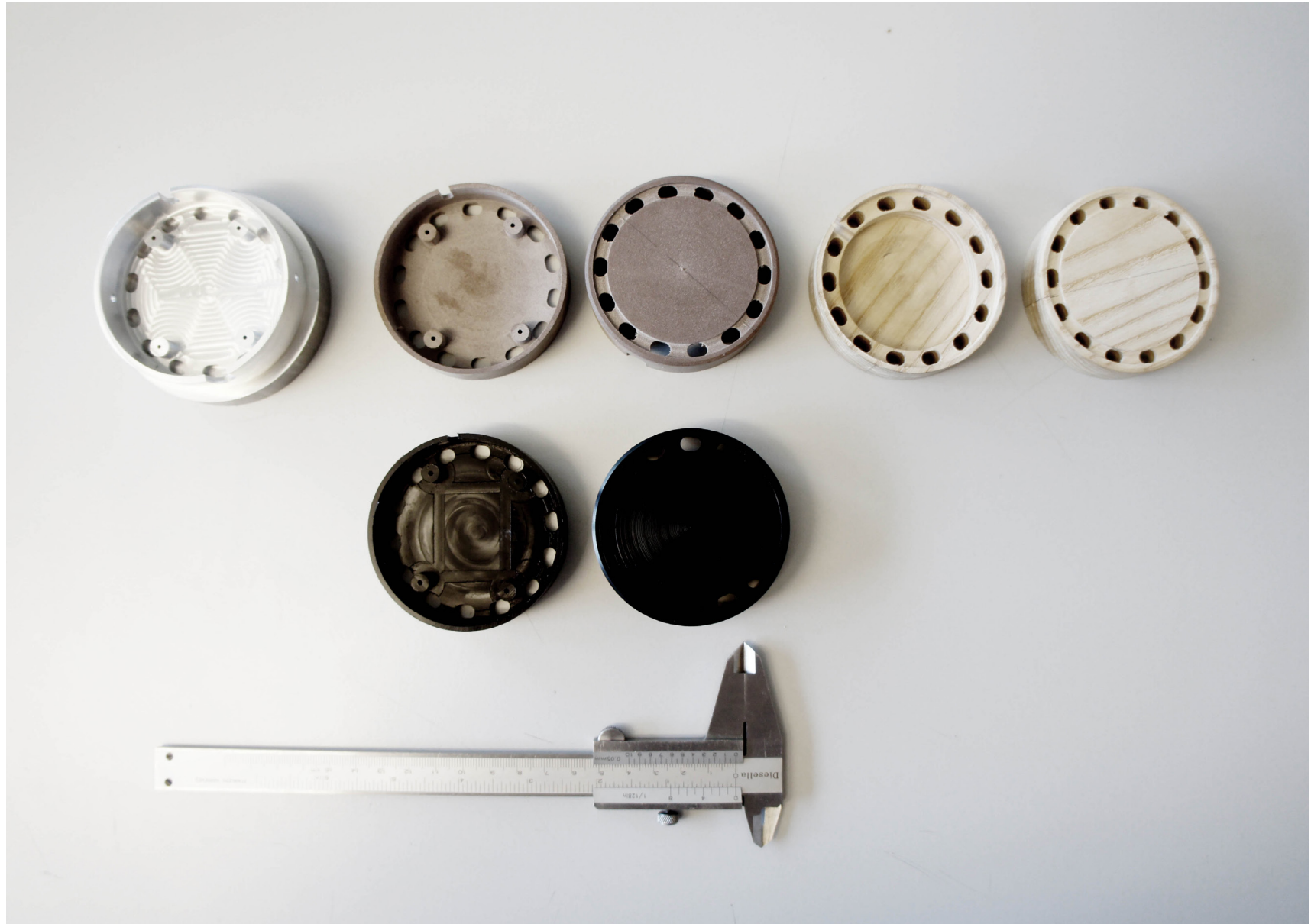
More models were made to test the proportions and ergonomics.

More models were made to test the proportions, ergonomics

CUSHION MAKING PROCESS

The layouts of cushions has been cut with laser cutter and later sewn by hand.

Drawings were made for headphone parts and given to engineers for CNC operation.

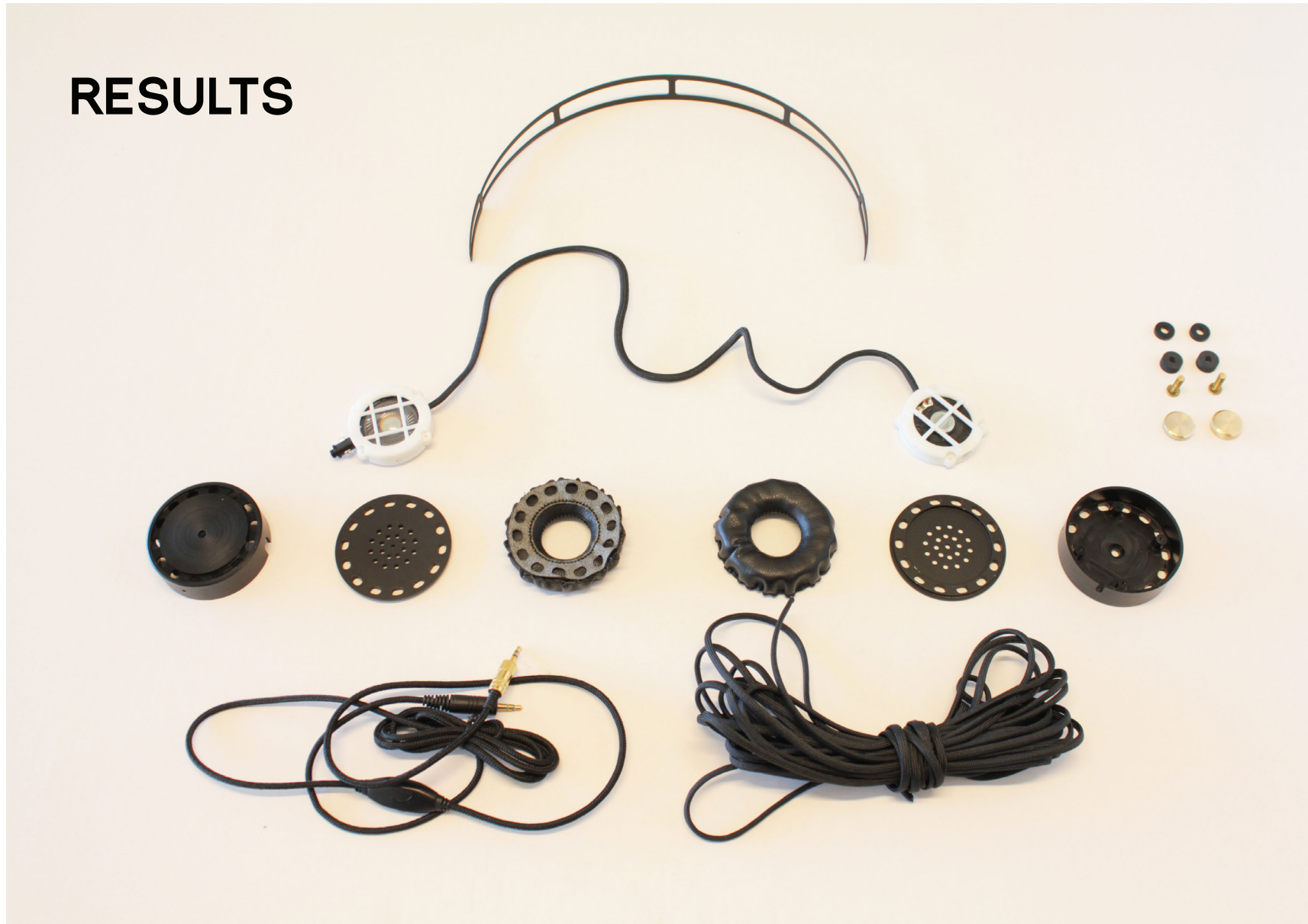Parts were made with different materials and tested

First assembled headphones turned to be with lots of errors. Therefore, I had to go back and redesign the frame.

FINAL IMPROVEMENTS

After sleepless nights headphone structure was redesigned and final prototype was completed
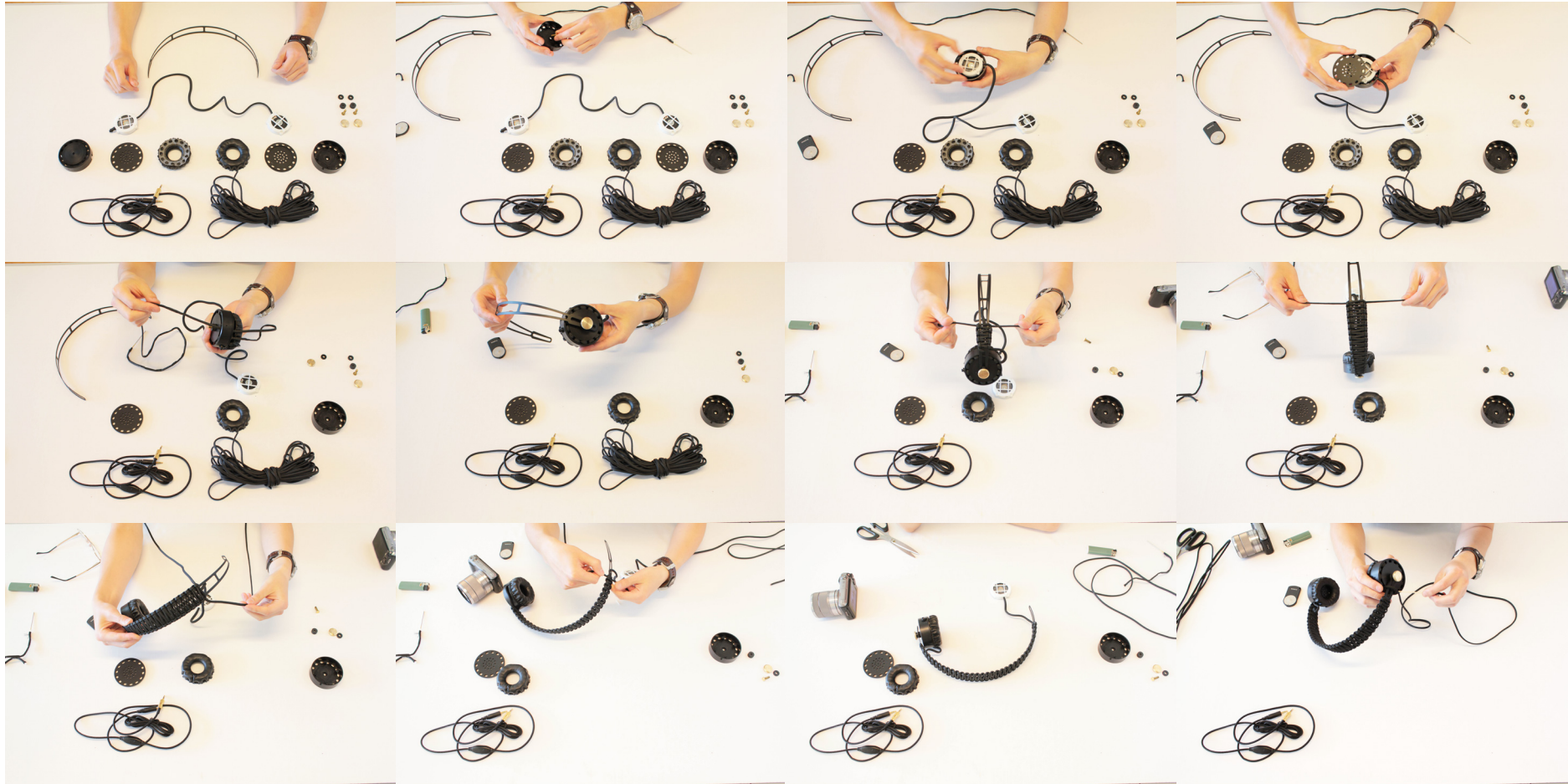
RESULTS

Here is a final result. The headphones which can assembled and disassembled.

PLATFORM

ASSEMBLY PROCESS

Assembly process turned out very complicated, but definitely worth for the sake of beautiful and repair friendly headphones.

PARACORD

A paracord or parachute cord is a lightweight nylon kernmantle rope originally used in the suspension lines of US parachutes during World War II. Paratroopers found this cord useful for many other tasks.

# BLACK COBRA

Repair friendly headphones

BLACK COBRA

Modular headphones
designed with care

" I MADE IT !
I WANT TO SHOW
PEOPLE THAT CHOICES
I MAKE CAN MAKE
DIFFERENCE.
I AM A COOL GUY AND I WANT
TO SHOW OF.

A user has to be satisfied with results since he was part of making a product. A user should also gain knowledge how to repair and customize a product by himself.

I AM A DESIGNER AND I CAN IT HAPPEN.
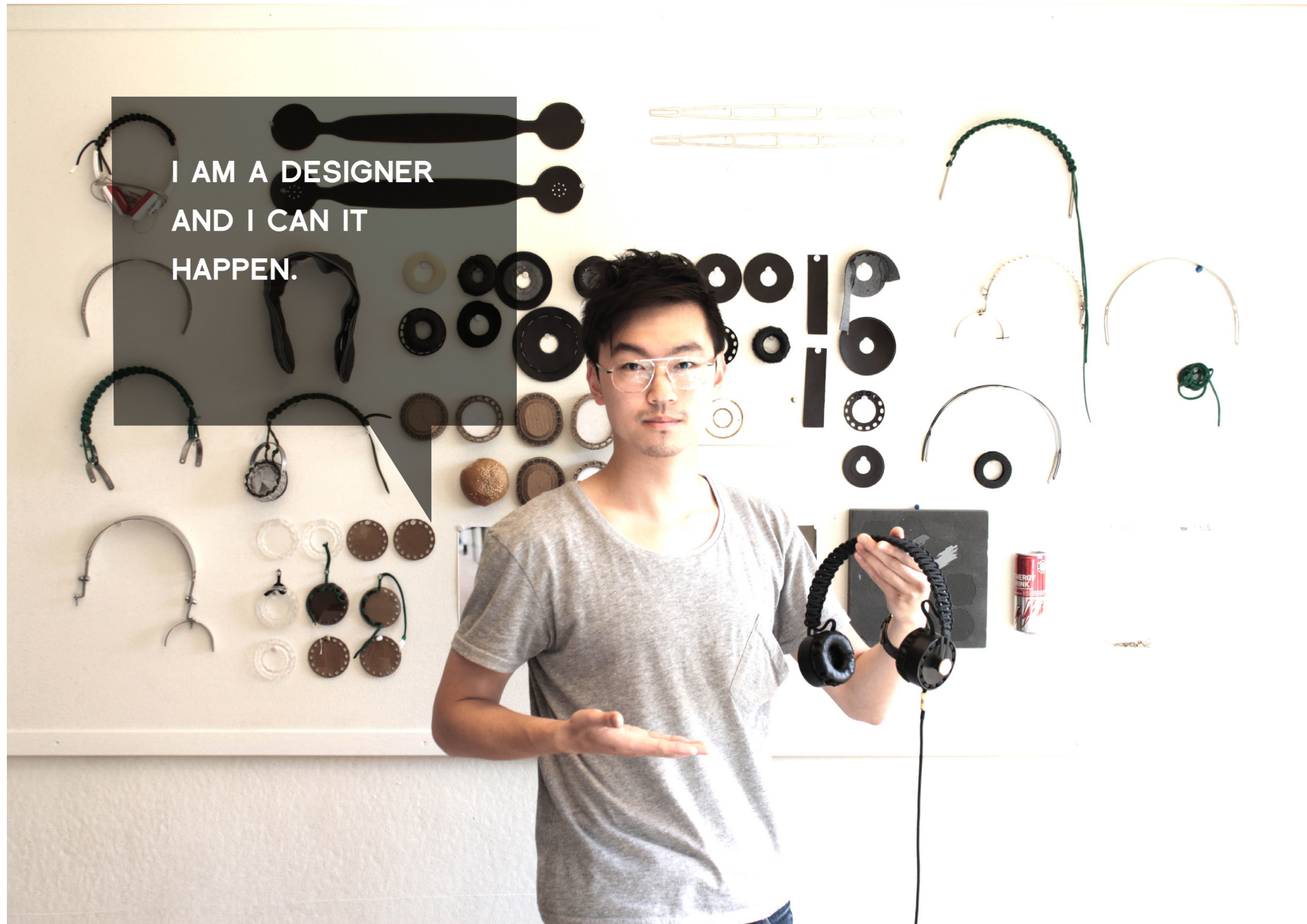
Finally a designer also has to be happy to create long lasting and self sustaining product .

THANK YOU

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PRODUCT
CARE
PROJECT

Fix to Keep !

Keywords: Product maintenance, system thinking,
responsibility, long lasting product.

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